ENERGY STAR® PRODUCTS

20 YEARS OF HELPING AMERICA SAVE ENERGY SAVE MONEY AND PROTECT THE ENVIRONMENT

A Star Is Born...

Legend has it that ENERGY STAR® began when the director of what was then known as the U.S. Environmental Protection Agency's (EPA's) Atmospheric Pollution Prevention Division conducted an informal walk-through of division offices. He wanted to see if employees remembered to turn their computers off when they left their workstations. He was not pleased with what he saw. He figured that if many of *his* staff—staff members who were dedicated to fighting climate change and well aware of the link between energy use and greenhouse gas emissions—forgot or found it too inconvenient to shut off their computers, the situation in the population at large was far worse. What was needed was a technical solution, a way to automatically turn off or power down computers when they were not in use...and thus, a star (or at least the twinkle of the star) was born.

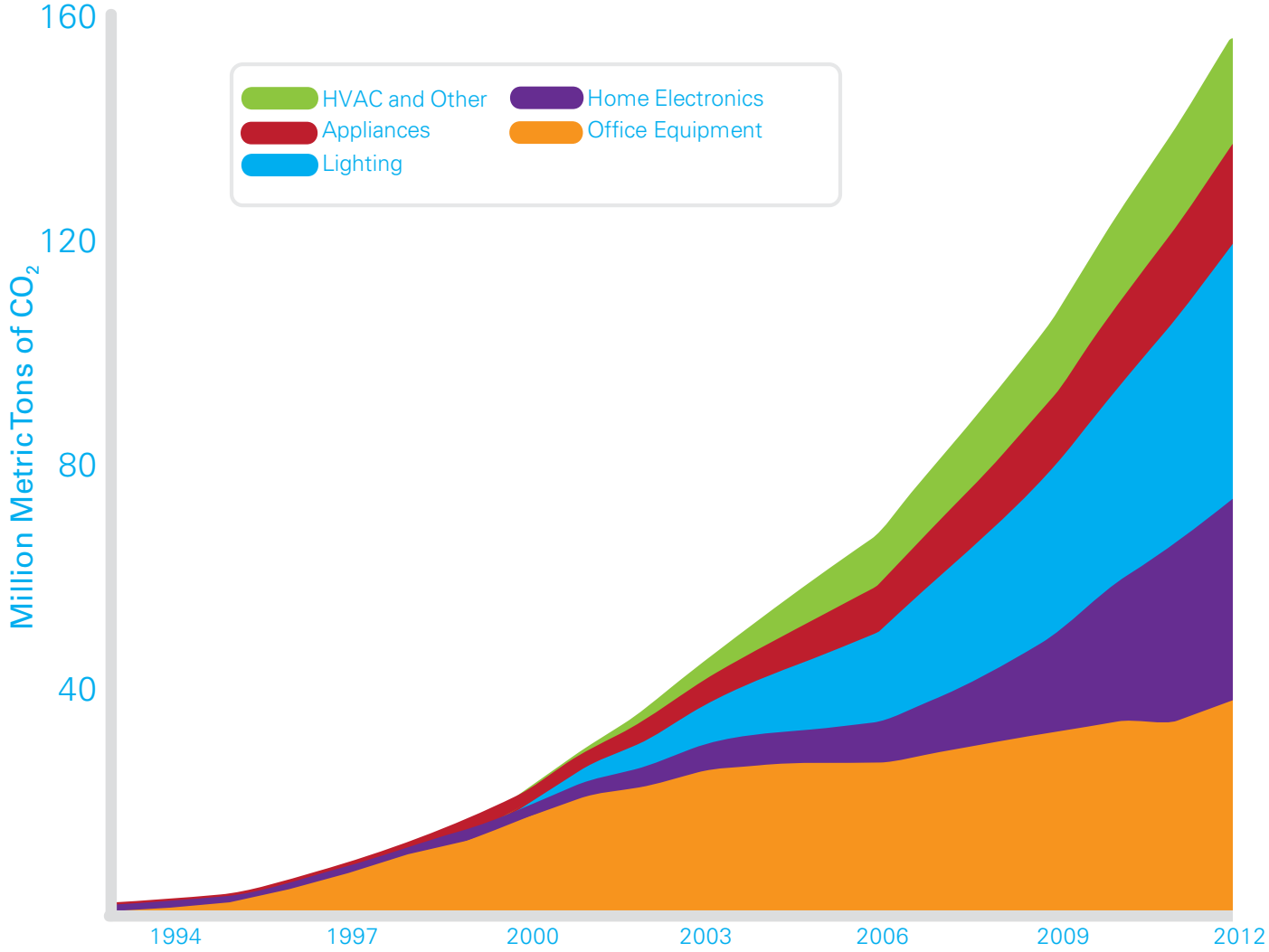
As with all good legends, there is a glimmer of truth to the story. In reality, a core of dedicated staff members had been working for a number of years to find cost-effective ways to reduce greenhouse gas emissions by analyzing data, then talking with business and industry about what prevented investment in energy efficiency and working with them to develop strategies to address those barriers. The growing energy demand of computers stood out, prompting the informal walk-through "audit" to help confirm the magnitude of potential energy savings and setting the stage for the very first ENERGY STAR qualified product.

During this time, computers were becoming more and more important to American business—they were the fastest-growing electricity load in the commercial sector. These early computers were not geared for energy efficiency, resulting in a negative impact on the bottom line where 30-40 percent of computers were left on after work hours. Interest in solving the problem of excessive power consumption would result in the creation of the ENERGY STAR program and mark the beginning of a journey to show the world that energy-efficient technologies can contribute to a cleaner environment and a growing economy.

Twenty years later, ENERGY STAR is a global symbol for energy efficiency. EPA recognizes ENERGY STAR products in more than 60 categories. More than 80 percent of U.S. consumers recognize and understand the label, collectively buying an estimated 300 million ENERGY STAR qualified products every year.

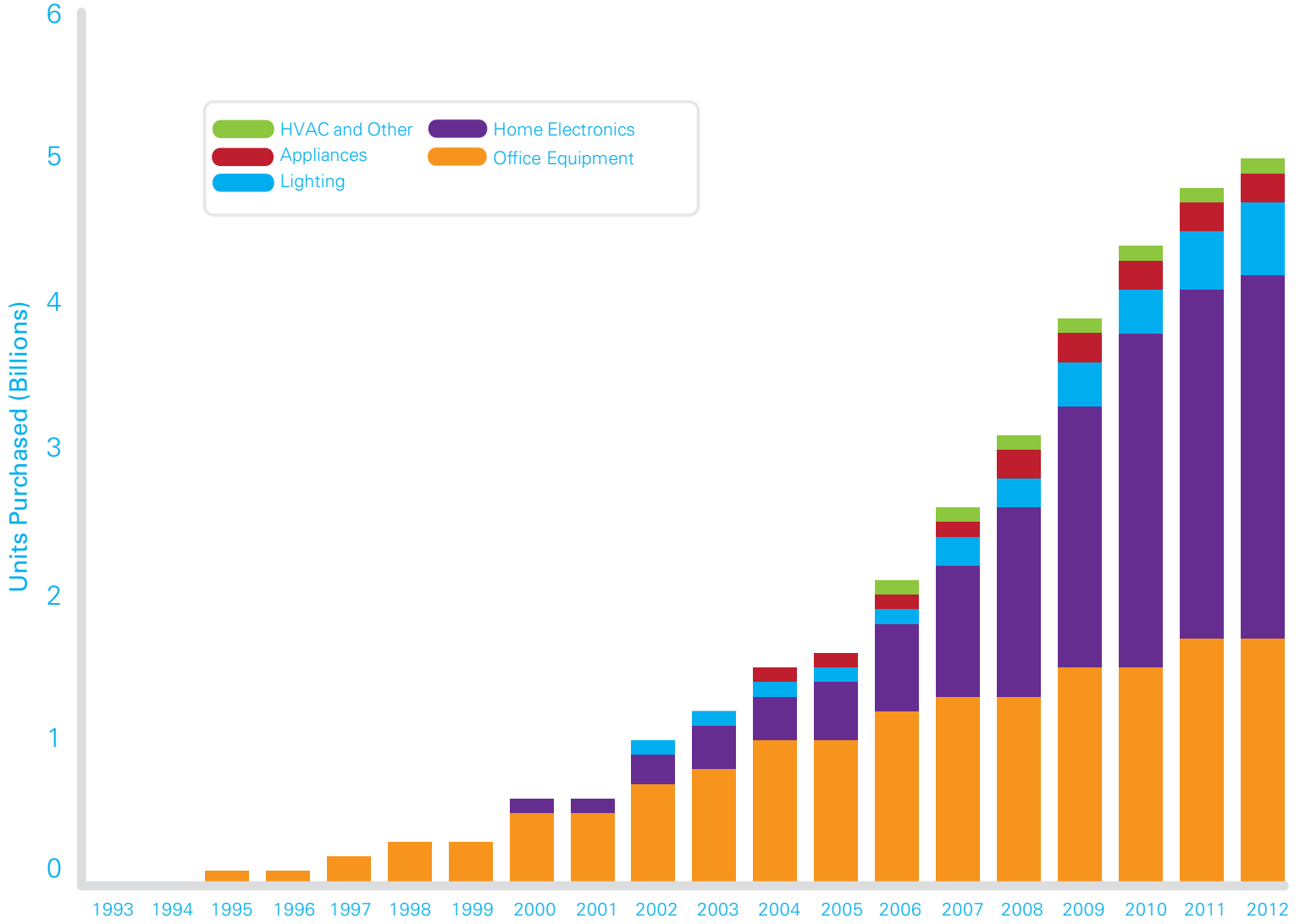
Environmental Results

Annual Greenhouse Gas Emissions Avoided



As of 2012, EPA estimates that ENERGY STAR products prevent more than 150 million metric tons of greenhouse gas emissions annually. More than 200 billion kilowatt-hours (kWh) of electricity is saved per year, which represents 15 percent of U.S. residential electricity use. These savings have offset the need for more than 185 additional power plants.

ENERGY STAR Products Sold (Cumulative)*



Since the program's inception, thousands of individuals from more than 2,200 manufacturing companies, 1,600 retailers, 800 energy efficiency programs and the federal government have worked under the ENERGY STAR banner to define, build and create both supply and demand for energy-efficient products. Over the past 20 years, Americans have purchased a total of more than five billion ENERGY STAR products.

**The lighting data do not include CFL sales. Product sales may not appear in every year a category was included in the program due to scale.*

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The ENERGY STAR Story

Climate Change Action

The ENERGY STAR program was an early part of the U.S. strategy to address global warming by reducing greenhouse gas emissions. It was first cited in President George H. W. Bush's 1992 Climate Action Plan, and subsequently in the Clinton Administration's 1994 and 1997 Climate Action Plans. Both administrations advocated creating incentives for private industry to voluntarily undertake emission reduction initiatives; incentives were designed to foster market choices that would increase energy efficiency.

Launched in 1992 as a cutting edge public-private partnership, ENERGY STAR was, and remains, a voluntary program; the American people—businesses and consumers—are the ones who have driven its success.

"[Emissions will be reduced] by harnessing private-market forces, by leveraging modest government expenditures to create a much larger set of private-sector investments..."

–President William Jefferson Clinton, 1993

Engaging the Market to Drive Change

The ENERGY STAR program was founded on the idea that greenhouse gas emissions could be reduced by overcoming market barriers that prevent consumers and businesses from doing what is in their financial interest—choosing energy-efficient products. In the beginning, EPA worked with technical experts within computer companies such as Apple, IBM Corporation, Hewlett-Packard and others[1] to develop the functional criteria necessary for a computer or monitor to earn the ENERGY STAR label.

1996

Exit signs were added to the program in a year when more than 100 million were in use in buildings throughout the U.S., with an operating cost of $1 billion per year. ENERGY STAR qualified exit signs used 80 percent less energy.

This first specification was technically attainable and most manufacturers agreed to upgrade the majority of their product lines to ENERGY STAR, which became an industry norm within a few years.

This pattern of engaging industry leaders early and openly was repeated as the ENERGY STAR program added more products in the ensuing years and involved other stakeholders, including trade associations, environment and efficiency advocates, utility and state efficiency program administrators, and international entities. Within a few years, key principles emerged that have guided this collaboration ever since: energy efficiency has to pay off for the consumer, and it cannot come at the expense of key product features or functionality.

But defining efficient products through an ENERGY STAR specification was only part of the solution. For the market to be changed, consumers needed to understand the multiple benefits of efficiency; manufacturers needed to produce and label these products, and retailers and contractors needed to showcase them to customers.

Starting in the mid-1990s, the U.S. Department of Energy (DOE) and EPA expanded the program to include residential products such as dishwashers, refrigerators, heating and cooling equipment and lighting. The government employed a "push-pull" strategy, designing outreach and educational materials to build consumer demand while simultaneously encouraging suppliers with a value proposition to ensure that products were available and featured the ENERGY STAR label. Eventually it became clear that to effectively reach consumers, the program needed to leverage the "touch points" at which buyers become most engaged—identified as predominantly retail point of sale. Many national retailers saw the value of being a source for environmentally friendly, energy-efficient products for their customers, but the key to success was showing them how to differentiate themselves by co-branding with ENERGY STAR in a way that was compatible with their individual corporate images.

1992

1997

2002

The Making of an Energy Efficiency Brand

At first, the ENERGY STAR message was simple and rational: ENERGY STAR saves energy and money. Advertising was limited to business and trade publications and was dominated by images of computers and monitors. The environmental message was conveyed by the logo itself—a half globe that included the phrase "EPA Pollution Preventer."

In 1997, EPA launched the first broad outreach campaign to encourage consumers to look for the ENERGY STAR label. Communication messages prominently featured environmental benefits, but the focus was still money savings achieved through superior energy efficiency. The tagline, "Saving the Earth. Saving Your Money." was added to outreach materials, which were designed to provide consumers with objective information about the government-backed label. The first consumer campaign had three key messages:

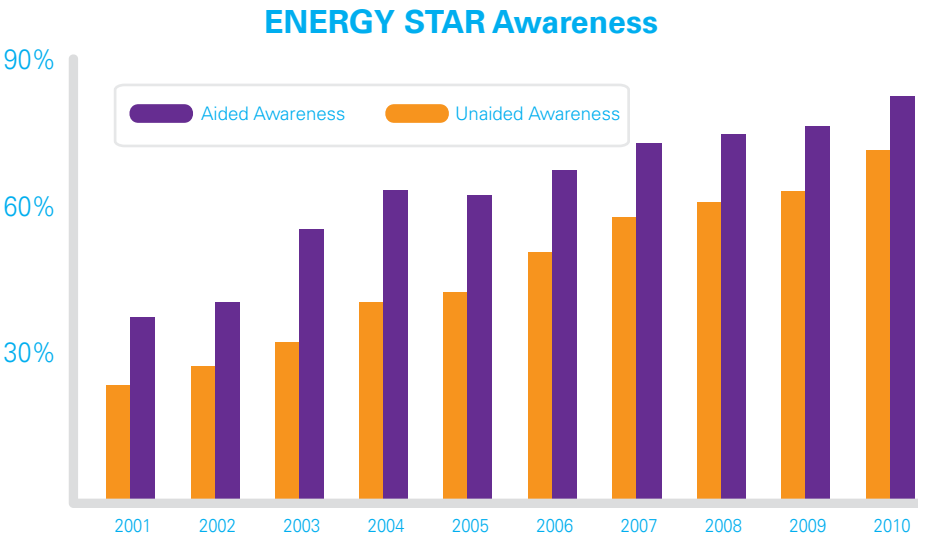
ENERGY STAR saves you money and protects the environment. Use of qualified products in your home can mean up to 30 percent savings.

The second price tag. Products have two price tags: the purchase price plus the cost of electricity needed to use the product over its lifetime.

An easy choice. Either the product is energy efficient because it displays the ENERGY STAR label, or it isn't.[2]

Making the environmental message more prominent was a natural outgrowth of the desire to connect with a large group of consumers who had not been linking their home energy use to its environmental impact. A public service announcement (PSA) that aired during this period connected the dots, "If it runs on electricity, it runs on fuel." It pointed consumers to ENERGY STAR as a simple way to do their part, with the tagline, "Money isn't all you're saving." An important sub-message in program outreach was that efficiency, unlike conservation, did not imply sacrifice—just smart choices, like choosing ENERGY STAR qualified products.

By 2000, 40 percent of U.S. households were aware of the ENERGY STAR label, and the program was producing tremendous, measurable results—cumulatively



saving $5 million in utility bills and preventing greenhouse gas emissions equivalent to the emissions from 10 million vehicles. But to take ENERGY STAR to the next level, an internal review of the brand revealed the need to appeal not only to consumer intellect but also to create an emotional connection.[3]

Launched in 2001, the *Change* campaign was just the solution. This campaign, an integrated multimedia outreach effort (radio, TV, print), was the most aspirational campaign to date. Through a combination of inspiring photography, music and messaging, EPA reached out to Americans, encouraging everyone to help protect the environment at home and at work.[4]

That same year, EPA conducted a full-scale review of the brand and developed the first comprehensive branding strategy for ENERGY STAR. The logo was redesigned to make it clearer, more visible and easier for partners to use. EPA also made the decision to develop a distinctive brand personality, designed to make an emotional connection with consumers.[5] The new logo and strategy continue to this day, positioning ENERGY STAR as not only the smartest financial choice, but also the right choice to make to protect the environment for future generations.

Maintaining Loyalty and Relevance

Twenty years ago, the connection between energy efficiency and environmental benefits was poorly understood by the general population; saving energy at home often meant donning sweaters or purchasing sub-optimal technology such as slow-to-illuminate compact fluorescent light bulbs (CFLs)—actions that only a small segment of the population undertook.

Today, nearly all Americans agree or strongly agree that "it is important to save energy in my home" and that "saving energy helps the environment."[6] Many believe improved appliance efficiency is important for reducing air pollution (92 percent important, 77 percent very important) and greenhouse gas emissions (84 percent important, 66 percent very important).[7] Nearly 70 percent of households with CFL bulbs are "very likely" to purchase more and 81 percent of households with CFLs have five or more.[8]

ENERGY STAR is an important part of this new landscape. More than 80 percent of Americans now recognize the ENERGY STAR label—30 to 45 percent of households report purchasing an ENERGY STAR qualified product in a given year. Importantly, almost 85 percent of purchasers would recommend ENERGY STAR to a friend.

EPA and DOE place a premium on earning and preserving that consumer loyalty, monitoring use of the label and the in-store experience to ensure that the label is used in a consistent and appropriate way, independently testing products purchased off the shelf and, more recently, requiring third-party verification and certification for all products prior to ENERGY STAR labeling.

To ensure that the ENERGY STAR label remains a reliable differentiator of energy-efficient products, the program has a ramped-up cycle for reviewing and revising efficiency criteria, particularly for those product categories where history has shown that the market responds rapidly to changes. And the program continues to evaluate and add new product categories every year.

ENERGY STAR Scores Well on Key Brand Attributes

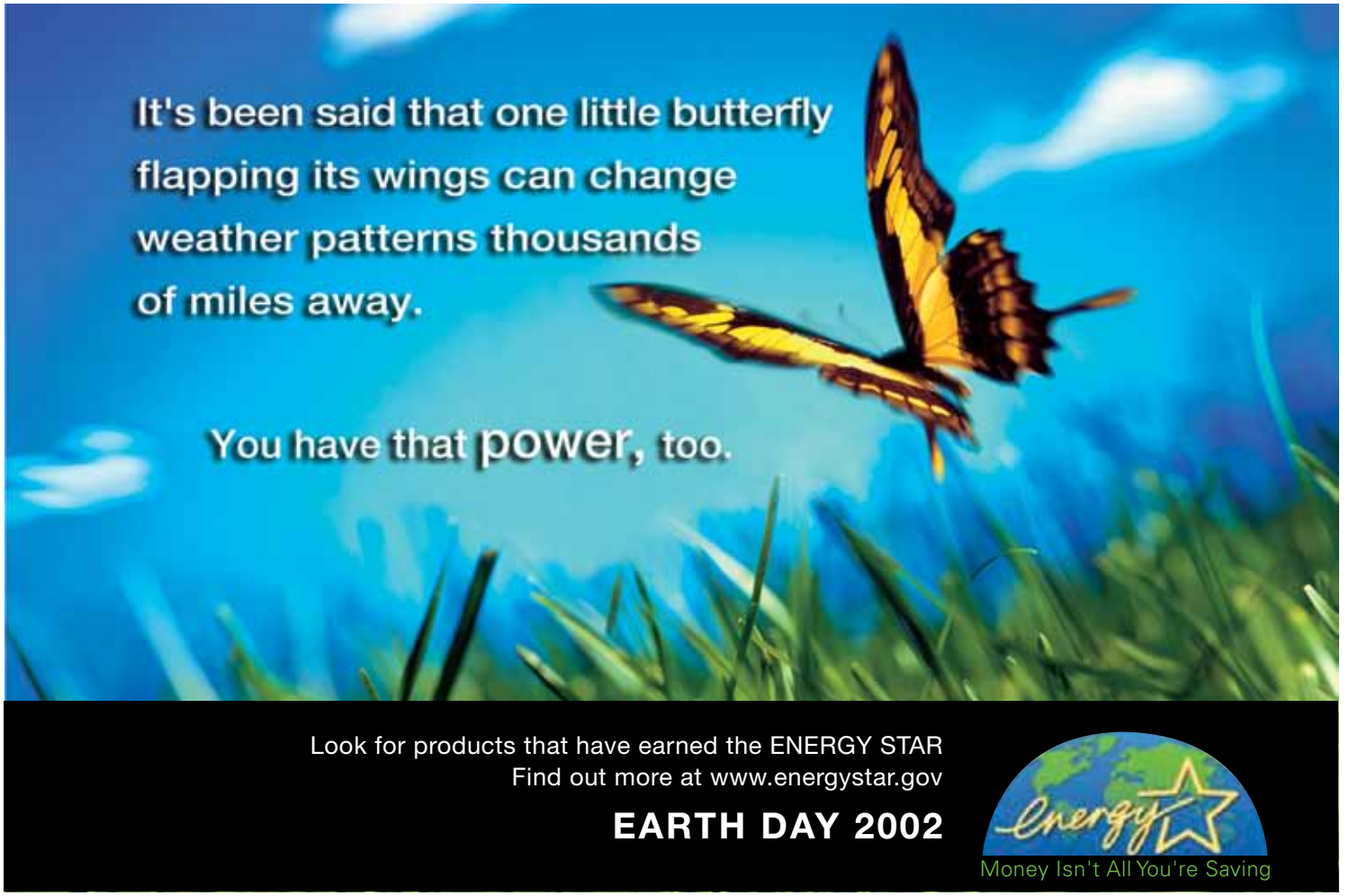
☑ **Relevance.** A successful brand must offer a relevant choice to its target audience. ENERGY STAR is relevant, allowing everyone the opportunity and ability to make a personal contribution to protecting our environment and reducing greenhouse gas emissions.

☑ **Differentation.** A successful brand must offer a sufficiently differentiated choice within the marketplace so that consumers see a different value. ENERGY STAR is differentiated as a government-backed program offering a compelling way to do good through the simple act of choice, while providing financial benefits to the consumer.

☑ **Consistent Communications.** A successful brand needs to speak to its audience in a compelling and consistent way. Managing all brand communications so that they deliver a similar message with a compelling image or personality is key to developing an understanding of the brand and its relevance. ENERGY STAR is a seemingly complex subject, but presented with a highly approachable, straightforward and consistent look and feel.

☑ **Credibility.** Credibility is the backbone of a successful brand. ENERGY STAR is fortified by the capabilities and reputation of EPA and DOE. Today, millions of consumers and businesses choose ENERGY STAR—demonstrating that ENERGY STAR has earned credibility in the marketplace.

Source: Interbrand. (2007). Building a Powerful and Enduring Brand: The Past, Present, and Future of the ENERGY STAR Brand. Produced for U.S. Environmental Protection Agency. http://www.energystar.gov/ia/partners/downloads/ENERGY_STARBndManf508.pdf


It's been said that one little butterfly
flapping its wings can change
weather patterns thousands
of miles away.
You have that power, too.
Look for products that have earned the ENERGY STAR
Find out more at www.energystar.gov
EARTH DAY 2002
energy
Money Isn't All You're Saving

2002

Download A File.

Format A Document.

Save A Planet.

Products that carry the ENERGY STAR® label come with an amazing feature: energy efficiency. And since wasting energy contributes to air pollution, you won't just be saving money on utility bills; you'll be saving the environment. It seems computers have indeed come a long way. Look for the ENERGY STAR label on other products as well. To find out more, call 1-888-STAR-YES (1-888-782-7937).

2001

YOUR HOME CAN CAUSE TWICE AS MANY GREENHOUSE GASES AS A CAR.

Discover steps you can take to reduce air pollution from your home and car at **energystar.gov.**

ENERGY STAR® is sponsored by the U.S. Environmental Protection Agency and the U.S. Department of Energy.

ENERGY STAR

2004

Major Milestones for ENERGY STAR Products

1992 EPA introduces the ENERGY STAR label for office products, starting with personal computers and monitors.

1993 President Clinton signs Executive Order 12845 requiring federal agencies to purchase ENERGY STAR qualified products when buying new office equipment.

1995 EPA expands the program to include heating and cooling equipment.

First international agreement established with Japan regarding ENERGY STAR qualified office products.

1996 DOE partners with EPA and establishes the first ENERGY STAR specifications for residential appliances.

1997 ENERGY STAR program expands into lighting.

1998 DOE adds windows, doors and skylights to the program.

First ENERGY STAR requirements set for consumer electronics, addressing standby power in TVs and VCRs.

2000 EPA establishes ENERGY STAR partnership with the European Union.

ENERGY STAR TV public service announcement appeared more than 25,000 times, reaching an audience of more than one billion.

2001 First commercial food service specification introduced: solid door refrigerators and freezers.

2002 ENERGY STAR label redesigned.

2003 ENERGY STAR program covers 40 product categories.

2005 First ENERGY STAR Change a Light Day: October 5.

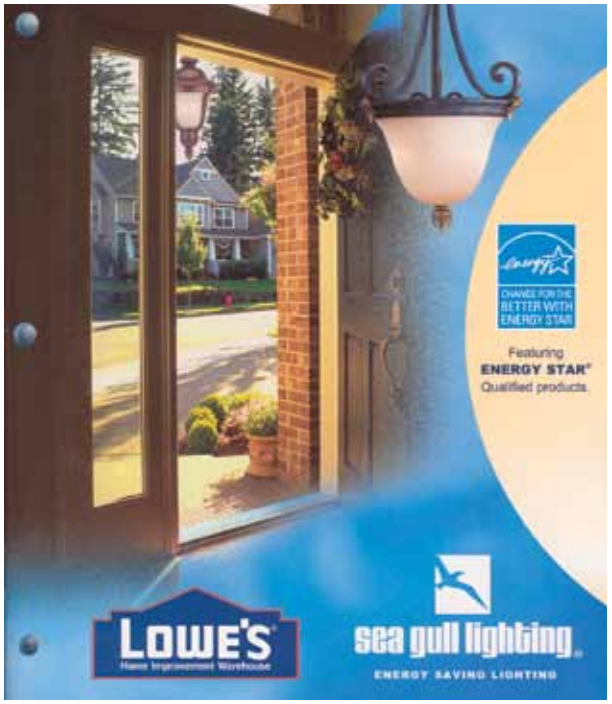
2006 More than two billion ENERGY STAR qualified products purchased since 2000.

Brand awareness jumps to over 50 percent.

2007 8th annual ENERGY STAR *Change a Light* campaign features first National Bus Tour.

2010 More than one million Americans participate in the *Change the World, Start with ENERGY STAR* campaign and take the ENERGY STAR pledge.

2006



2002

2003

The Power of Partnership

Whether opening your utility bill or browsing the aisles of your neighborhood big-box store, you will often spot the trademark cyan logo. A broad range of partners is at the heart of the ENERGY STAR program's success—not only manufacturers and their trade associations, but also the retailers that deliver ENERGY STAR products to market, and utility and other efficiency program administrators who engage in promoting energy-saving opportunities to their customers.

In 1995, EPA labeled the first suite of ENERGY STAR products geared toward the residential central heating and cooling (HVAC) market. Systems then were sold through a large, disaggregated network of heating and cooling contractors. The Agency teamed up with the Air Conditioning Contractors of America (ACCA) to promote ENERGY STAR messaging and sales strategies to its membership and worked to build consumer awareness through the media. The program's first video news release was developed and aired by local news outlets around the country. In 1998, Sears agreed to use the ENERGY STAR logo and HVAC savings facts in its national advertising circular on a regular basis. Sears estimated that each print supplement reached approximately 40 million people.

It was when the program began labeling and actively promoting appliances and lighting that the stars really began to align, solidifying partnerships with retailers and efficiency programs. White goods—including refrigerators, dishwashers and clothes washers—are an integral part of daily life, and lighting is a frequently purchased, ubiquitous product; retailers devoted significant floor space to showcasing them. Together, these product categories consumed a large portion of the household energy budget, so operational savings associated with ENERGY STAR were compelling; the cost premium associated with high-end

2005

2007
Oprah Winfrey devoted an entire show to the environment and featured ENERGY STAR products as a tool in the fight against climate change.

models meant retailers could make money "up-selling" consumers to ENERGY STAR products. Sears, among the first to recognize the potential for leveraging ENERGY STAR as a differentiator, seized the opportunity to increase sales not only with house-brand Kenmore products, but also across all of its ENERGY STAR qualified appliances.

In addition, in areas of the country where the electricity supply was becoming constrained—predominantly California, the Pacific Northwest, the Northeast and Wisconsin—regulators mandated that utilities fund energy efficiency programs in order to avoid or delay the need to build costly power plants or buy expensive energy from the electricity market. Appliances and lighting were prime targets for efficiency programming, and the higher cost of the more efficient models presented a market barrier that could be targeted by utilities through rebates and discounts.

While utility programs presented an opportunity for retailers, they also posed challenges. Utilities as well as state agencies were involved in delivering energy efficiency programs, but the efficiency levels they targeted often varied by market, as did the types of incentives offered. DOE and EPA began working with national and regional organizations involved in efficiency programs. Fortunately, these early partners, including the Consortium for Energy Efficiency, the Northeast Energy Efficiency Partnership, the Northwest Energy Efficiency Alliance and later the Midwest Energy Efficiency Alliance, were eager to engage with the ENERGY STAR program. They understood their members' needs and conveyed the importance of ENERGY STAR as a common platform for educating consumers.

As more appliance retailers came on board, including those new to the market such as The Home Depot and Lowe's Companies, investment in education and promotion at point of sale increased. EPA began working to provide retailers with the building blocks they needed to position ENERGY STAR in a way that was compatible with their own brands. The Agency fostered dialogue between retailers and the efficiency community, in light of their differing business practices, so that common messages and educational themes could begin to emerge.

The first ENERGY STAR partner meeting was held in 2000 to facilitate best-practice exchange, networking, and promotion among manufacturers, retailers and energy efficiency program sponsors. The first nationally coordinated ENERGY STAR products promotion followed in 2001. More than 100 utilities and other program sponsors, hundreds of retailers, and 25 manufacturers participated. The national partner meetings and products promotions have continued; 2011 marked the largest annual partner meeting to date, attracting more than 620 attendees. The result: consumers nationwide know they can count on their utility companies and local retailers to make energy efficiency choices easy with ENERGY STAR.

Today, ENERGY STAR is a global symbol for energy efficiency. Computers, printers, copiers and scanners that have earned the label can be found throughout Europe and in Japan, Australia, New Zealand and Taiwan. In Canada, almost 90 percent of the population recognizes the ENERGY STAR symbol, where it appears on almost every product category in the program. Emerging economies such as China and India take advantage of ENERGY STAR test procedures and performance standards. For manufacturers of globally traded products, consistency in standards and labels translates into one large market for their energy-efficient models and a reduced cost of doing business.

Because of this vast network of partners, consumers and businesses throughout the U.S. and around the world are helping to protect the environment, with the help of ENERGY STAR.

A Platform for Energy Efficiency Programs

Marc Hoffman, Executive Director, Consortium for Energy Efficiency

Twenty years ago, energy efficiency programs were just starting to work with each other. Program administrators quickly realized the power of voluntarily aligning their efforts and formed the Consortium for Energy Efficiency (CEE). Within the organization, they could work together on appliance efficiency (and HVAC, then lighting, then motors, and so on). But to make inroads into the mass markets, the dispersed energy efficiency programs also needed a single, trusted brand to mark these new, more efficient products—one that customers could easily recognize and was simple to understand. A consumer needs to be able to easily ascertain whether a product is efficient or not, and efficiency should just be one more factor—no cutting corners on other product features!

When the federal government came up with the concept for ENERGY STAR and then extended it to appliances, CEE carefully deliberated before incorporating the brand into its own plans for advancing efficiency. Over time, the decision of CEE members to adopt ENERGY STAR as their marketing platform for energy efficiency has proven to be a great one. Surveys show that ENERGY STAR is an important endorsement label for consumers and that it plays an equally important role as the marketing platform for myriad energy efficiency programs. CEE members—who often promote energy-efficient products with financial incentives—depend on the continued integrity of ENERGY STAR to achieve their energy-saving goals. In turn, CEE members create brand traction in local service territories.

It is a win-win relationship, one that has been particularly instrumental in leading to transformations in the market for most major household appliances. For example, in 1993 there were practically no efficient front-loading clothes washers in the United States. By 1999, through a combination of events—the power of the ENERGY STAR platform, the introduction of CEE "advanced tiers" of product energy efficiency performance, and program promotional dollars—70 efficient models were available, and one million ENERGY STAR clothes washers had been sold. Importantly, today all clothes washers, dishwashers, and refrigerators use significantly less energy than they did a decade ago, since voluntary efficiency efforts have made it easier and more cost-effective to increase national energy efficiency standards that lock in savings. What's even more impressive is that working together, the EPA, DOE, CEE members, and industry continue to deliver meaningful additional energy savings, steering consumers to more and more efficient options. Once the energy hog of the household, today's ENERGY STAR qualified refrigerators use less energy to operate than an incandescent bulb.

EPA maintains a brand that simply and credibly identifies cost-effective energy-saving opportunities that do not compromise amenity or reliability. In turn, CEE members actively promote ENERGY STAR in their energy-saving programs, thereby simplifying energy efficiency decision-making for their customers and helping to grow the brand. ENERGY STAR also presents an excellent rallying point for energy efficiency organizations and industry to work cooperatively. We consider ENERGY STAR to be America's most trusted and recognized brand for energy efficiency.

CEE members congratulate the ENERGY STAR program and the hard work of EPA and DOE on their efforts to grow the ENERGY STAR brand over 20 years. Thank you and here's to your ongoing success!

CEE
Consortium for Energy Efficiency

ENERGY STAR in Canada

Kathy Deeg, Chief, ENERGY STAR Canada, Natural Resources Canada

As ENERGY STAR's pre-eminent international partner and administrator of the ENERGY STAR program in Canada since 2001, we at Natural Resources Canada (NRCan) would like to extend our congratulations on the ENERGY STAR 20th anniversary! In 1992, you created a program that continues to help transform our world to a more energy-efficient one. As we all know, to remain relevant for 20 years is a major accomplishment.

Since its beginning 10 years ago, the ENERGY STAR program in Canada now has more than 1,500 ENERGY STAR participants and supports more than 50 eligible product categories, and we are still growing.

EPA, DOE, and NRCan have worked hard to make the program seamless for participants on both sides of the border. Program development, product specifications, branding and conformity assessment have been fully supported by all.

And Canadians have responded to our outreach on ENERGY STAR. In 2010, 7 out of 10 Canadians understood the ENERGY STAR symbol, even without a visual reference, and 89 percent recognized it in an online survey and knew what it stood for. A Canadian discrete choice survey done in 2009 (for refrigerators and TVs) concluded that when all other product options are the same, about 7 in 10 consumers will select the ENERGY STAR qualified model over other models.

And these efforts have been successful where it counts most—on the salesroom floor. In 2010, Whirlpool marketed over 450 ENERGY STAR qualified product models in Canada, a 16 percent increase over the previous year. Dufresne Furniture & Appliances operates stores in Ontario and Manitoba, and all of their dishwashers and most of their refrigerators are ENERGY STAR qualified. About 70 percent of the refrigerators that Leon's sells are ENERGY STAR qualified, a 45 percent increase from five years ago. Samsung reports that all its appliances sold in Canada are ENERGY STAR qualified.

We expect our collaboration with EPA and DOE to deepen in the upcoming years. We remain amazed by the impact of the ENERGY STAR program and the ability of industry partners to respond with products that help us meet our energy efficiency and environmental goals.

Natural Resources Canada

Ressources naturelles Canada

Canada

ENERGY STAR Product Retrospective

The ENERGY STAR story has played out in different ways for different products—in some cases over long periods of time, and in others rather quickly. For most, the story continues. For all, the interplay of government, business, non-profit and market forces have literally changed history.

Computers and Monitors

It was 1992: a typical office information processing set-up included a CRT (cathode ray tube) monitor, usually beige and occupying about 15 x 15 inches of desk space, attached by wires to a keyboard and sitting atop or next to an equally large computer. About two percent of the U.S. population had access to the Internet,[9] and leading-edge companies were debating whether to build websites or continue to invest in bulletin board systems to share information. Employees were becoming increasingly computer literate, able to produce smartly desktop-published documents for spiral binding, using functions such as "ctrl-v 4,34," a standard keystroke on an IBM desktop computer platform.

Unfortunately, those same employees for whom computers were becoming an integral part of work life had little tolerance for shutting down and later rebooting their computers or monitors if they stepped away from their cubicles or offices. Nor were they cognizant of the environmental impact of leaving computers turned on. Few people understood or internalized the link between their energy use and CO_2 (carbon dioxide) emissions, a leading contributor to global warming.

The Information Age was changing the way we worked, learned and interacted, and technology was evolving rapidly to create and keep up with growing demand. Not inconsequentially, the energy use associated with technological innovation was also on the rise. Estimates in 1990 indicated that computers and related peripheral equipment consumed 40 billion kilowatt-hours of electricity in the U.S.—five percent of commercial sector electricity—and were one of the fastest-growing but most overlooked electricity loads.[10]

2009

When computer servers were added to the ENERGY STAR program, energy bills for data centers were growing twice as fast as revenues, rising by 16 percent per year.[11] A server that has earned the ENERGY STAR can save as much as $480 in electricity costs, with an extra $480–$1,440 savings in associated cooling costs.[12]

By then, the scientific link between manmade greenhouse gas emissions and global climate change was also well established. President George H.W. Bush outlined in his 1992 National Action Plan for Global Climate Change several strategies to reduce emissions by reducing energy consumption. EPA's voluntary programs, including the ENERGY STAR computer program, were among those strategies. Their shared mission: to demonstrate market-based approaches for reducing greenhouse gases and other air pollutants by understanding the barriers that limit greater investment in energy efficiency, and developing and deploying strategies to overcome those barriers.

Lack of supply and lack of demand were identified as interrelated barriers to greater computer efficiency:

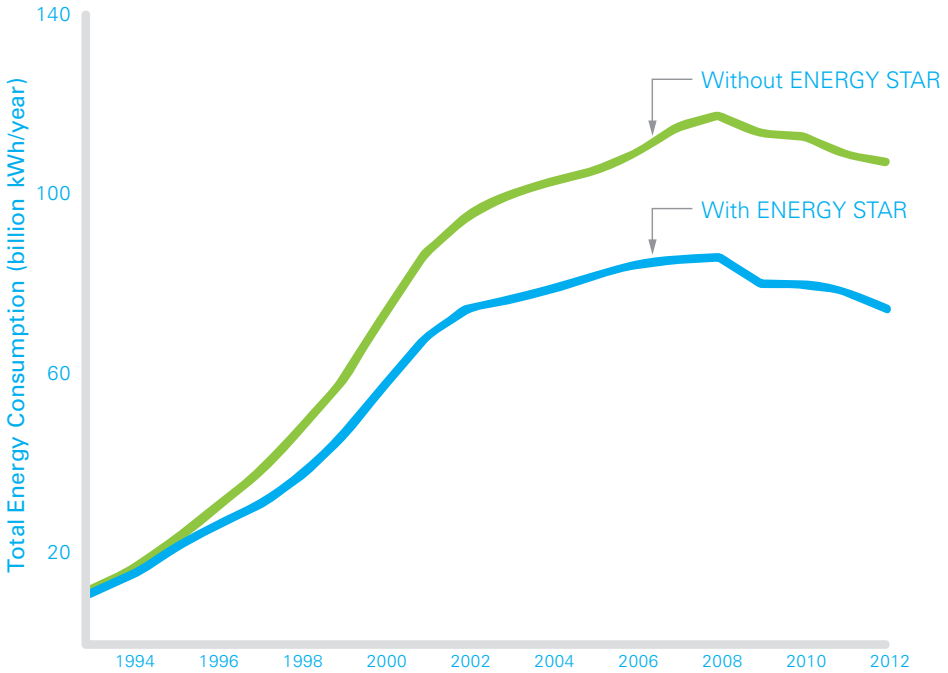
- Among computer users there were widespread but unfounded beliefs that turning computers off, even occasionally, shortened typical lifespan and that using screensavers reduced electricity consumption. In addition, there was an obvious lack of efficient product supply and no way to differentiate energy-efficient models even if they existed.[13]
- Initial concerns with efficient technologies were related to adverse effects on component lifetimes as well as cost premiums. But by 1992, technological hurdles were less of an issue. Instead, manufacturers cited lack of market demand for efficient products as the biggest barrier. A product development specialist for a major computer manufacturer remarked that they had once considered incorporating low power states into their main-stream product line but were told by their marketing department not to bother.[14]

Seeking to offer a credible way to designate energy-efficient products, EPA initiated meetings with members of the computer industry to discuss forming the ENERGY STAR program. The first step was to figure out a way to define and implement energy-saving features.

EPA and stakeholders ultimately coalesced around a functional criterion: the ability of a computer or monitor to go into a low power or "sleep" state after a period of inactivity. Power management was not yet a product attribute for desktop computers and monitors.[15] The first ENERGY STAR specification required computers and monitors to consume 30 watts or less in this mode—a 70 percent savings from normal usage (integrated computers and monitors were given a budget of 60 watts in sleep mode).

That same year, EPA rolled out the "EPA Energy Star—Pollution Preventer" logo as a way for consumers to easily recognize efficient products from a trusted source: the U.S. government.

The ENERGY STAR Difference: Computers & Monitors



Even with a drop in sales due to the recent economic slowdown, the race for faster, more powerful, more highly featured computers and monitors continues. In 2012, energy use in the U.S. associated with these products is 32 billion kWh per year less than it might have been without ENERGY STAR.

The government did something else to drive demand and supply for energy-efficient computers and monitors—it became the largest procurer. On April 21, 1993, President William Clinton issued an Executive Order directing federal agencies to purchase ENERGY STAR computers and monitors.[16] This significantly increased the supply of ENERGY STAR qualifying products; by the end of 1994, more than 2,000 ENERGY STAR qualified models were available, and all major manufacturers were participating in the program.[17]

1992

Since then, the ENERGY STAR computer and monitor specifications have been revised multiple times, ratcheting down the power that computers and monitors consume in sleep mode from 30 to 2 watts or less. They now include requirements that power-saving features be preset and enabled to conserve energy, and they have tackled energy-saving opportunities in other modes such as "idle," where desktop computers spend 30–60 percent of the time running basic default applications after the operating system and software have completed loading. Efficiency criteria were eventually added for internal and external power supplies, the components that convert alternating current (AC) from the wall socket into direct current (DC) and regulate the voltage needed to operate computers. Efficient power supplies enhance the efficiency of computers in all operating modes.

Today, work continues on improving the efficiency of networked systems. To address these new savings opportunities, the European Commission and other international partners, the Natural Resources Defense Council (NRDC), Information Technology Industry Council members, other program stakeholders and EPA work collaboratively to research and coordinate development of internationally acceptable definitions and test procedures.

As the information technology marketplace has evolved, so has the ENERGY STAR program—expanding to cover other office products, tackling new operational modes and usage patterns and learning along with industry how best to manage power while responding to innovation. So far, EPA estimates that ENERGY STAR office equipment has saved more than 500 TWh (terawatt-hours) of energy in the U.S., resulting in energy-bill savings of more than $50 billion.

Co-Evolution of Efficient Computer Technology and ENERGY STAR

Stephen Harper, Global Director of Environmental and Energy Policy, Intel Corporation

The ENERGY STAR program's focus on personal computer technology has evolved in parallel to the technology itself since the introduction of the first ENERGY STAR specification for computers in 1992. EPA's approach to maximizing energy savings without compromising on performance or features has been critical to the success of this longstanding partnership, particularly given the astounding rate of change in the computer industry.

By ensuring a level playing field for manufacturers and building market demand for energy-efficient products, ENERGY STAR has helped incentivize a rapid and meaningful progression toward efficient computing, taking advantage of rather than hampering industry efficiency innovations. These innovations include massive improvement in the efficiency of the microprocessors, the brains of modern IT equipment, which have improved by nearly 3 million percent since 1978, in terms of the number of computations performed per second per watt. (By contrast, automobile efficiency measured in miles per gallon has improved only 40 percent over the same period.)* Similarly, system level improvements such as the move away from cathode ray tubes to LCD, and later mobile technologies that maximize battery capacity and minimize heat, have led to increasingly efficient equipment.

Early iterations of the computer specification focused on activating power management and driving down energy use in low power modes. Since the start of this partnership, low power modes have dropped from more than 30 watts to less than one. Today, computer manufacturers ship their products globally with power management capability enabled.

The program and its partners next moved to improve the efficiency of idle mode, the state in which the device is turned on but not doing any computational work. This focus made sense because studies showed that the vast majority of computer-related energy is used in this state. Industry interest in earning the ENERGY STAR with higher performing and more richly featured products led EPA and stakeholders to categorize systems in terms of functionality such that higher-performing systems were compared to like, versus less capable, systems when competing for the ENERGY STAR, an approach that ensures that consumers get both the savings and the features they value. In addition, EPA has incorporated component-level requirements into the ENERGY STAR specifications, such as those for internal and external power supplies, wringing out additional energy waste and helping to drive economies of scale in the production of more efficient components.

The synergy of underlying technology/market trends and the evolution of the ENERGY STAR computer program have led to huge energy savings at the same time that society's computational capacity has vastly increased. Additional efficiency gains are possible if today's more efficient computers (and other IT equipment), networked together, can be used to power the Smart Grid, intelligent transportation, smart logistics systems, and building energy management systems. Industry and EPA's ENERGY STAR program have garnered success by collaborating for two decades and will continue to work together to realize future benefits.

** American Council for an Energy-Efficient Economy, "A Smarter Shade of Green," 2008.*

ENERGY STAR Product Retrospective

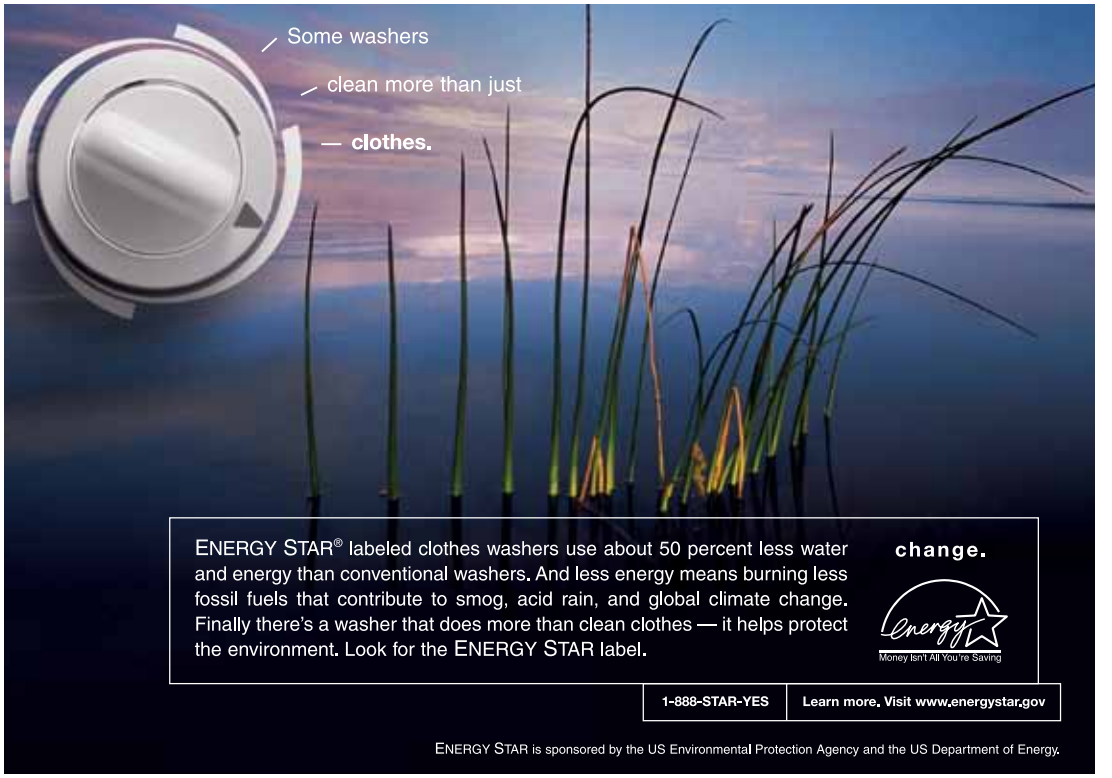
Clothes Washers

The promise was there, but the market was not. In the late 1990s, efficient horizontal-axis clothes washers, now known as "front loaders," were estimated to use 40 percent of the energy and 60 percent of the water of a conventional washing machine. They were gaining in popularity in Europe but represented just two percent of the U.S. market, despite their introduction by several major manufacturers.[18] It took the small community of Bern, Kansas, population 210, to make resource-efficient clothes washers part of the national landscape.

Bern was chosen to participate in a cooperative venture between the U.S. Department of Energy (DOE) and Maytag Appliances to validate the performance and consumer acceptability of front-loading washing machines in a real-world setting. The town was selected because of its small size, community water supply issues, and participant willingness and enthusiasm. In exchange for participating, residents would receive Neptune horizontal-axis washing machines, courtesy of Maytag, that they could keep.[19]

A primary goal of the study was to collect data that would be helpful in moving the clothes-washer market toward higher efficiency options, with the ENERGY STAR program as a likely vehicle for market transformation. The study lasted five months and included rigorous pre- and post-wash measurements on load size, water use, energy use and cleaning satisfaction. It found that participating households used, on average, 38 percent less water and 58 percent less energy with the front loader. Across load weight, temperature settings and detergent and other additive choices, participants found the cleaning performance of the front- loading washers to be generally superior to that of their original machines, irrespective of age.[20] DOE had the data it needed to launch development of an ENERGY STAR specification.

DOE, ENERGY STAR partners and other stakeholders agreed to an initial technology-neutral specification with an Energy Factor (EF) of 2.50, more than 100 percent better than the federal minimum energy conservation standard.[21]



Major manufacturers, including Maytag, Frigidaire and Miele, were quick to introduce qualifying products. Other manufacturers followed suit with a range of conventional and front-loading products that met the ENERGY STAR specification. Then it was time to tackle other market barriers: lack of awareness of efficient clothes washers and their performance benefits among consumers, and higher initial cost.

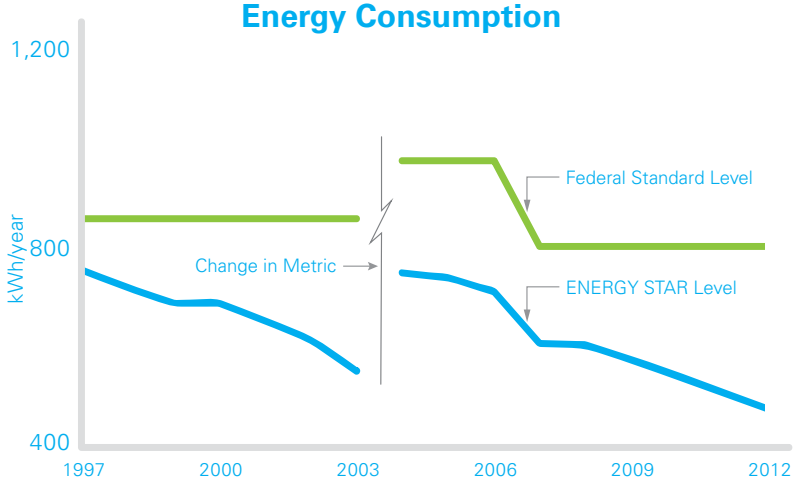
ENERGY STAR state and utility partners began educating their customers about the opportunity to save energy. They often coupled education with rebates for ENERGY STAR qualified clothes washers, to help reduce the initial cost difference between qualified and standard washers. The Consortium for Energy Efficiency, California investor-owned utilities, Northeast Energy Efficiency Partnerships and Northwest Energy Efficiency Alliance (NEEA) were particularly active in rallying utilities to align education and incentives to spread the word. For example, NEEA's ENERGY STAR Grimiest Soccer Team Contest invited 15,000 youth soccer coaches to submit photos of their teams at their grimiest. NEEA hosted high-profile clinics throughout the Northwest with U.S. Women's National Soccer Team celebrity Tiffeny Milbrett, challenging participants to "Get Dirty, Score Big, and Clean Up with ENERGY STAR."[22]

The Bern study pointed out the important link between energy and water savings—greater energy savings could be achieved in both drying and washing if the washing machine used less water and did a good job of wringing out excess water. In subsequent years, DOE introduced a water factor requirement and test procedure for clothes washers. ENERGY STAR criteria for clothes washers have been revised several times to respond to changing market conditions and to help ensure meaningful additional energy savings to consumers each time federal minimum efficiency standards change.

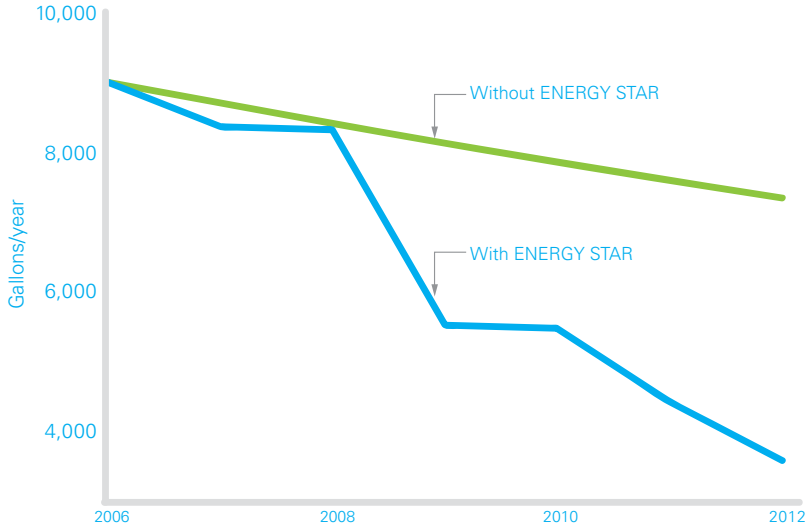
According to a national study by the U.S. Energy Information Agency, in 2009, 41 million households—36 percent of all U.S. households—had ENERGY STAR qualified clothes washers in their homes.[23] Altogether, about 30 billion kWh and 110 trillion Btu of energy have been saved, avoiding more than 25 million metric tons of greenhouse gas emissions.

The ENERGY STAR Difference: A Typical Clothes Washer*

Energy Consumption



Water Consumption



Today, an ENERGY STAR clothes washer uses about 70 percent less energy and 75 percent less water than a standard washer used 20 years ago.

**3.46 cu ft., electric water heating, not including dryer energy.*

A Catalyst for Change: ENERGY STAR Appliances

Nick Gillespie, Government Relations Senior Specialist, Whirlpool Corporation

Throughout the last 20 years, ENERGY STAR has been the market transformation program catalyzing manufacturers to introduce eco-efficient appliances into the market place that significantly benefit the consumer and the environment. Although ENERGY STAR is a voluntary program, it did not take long for Whirlpool Corporation to see the potential in and help formulate what has become one of the most recognizable brands of its kind.

To put this in perspective, the 2011 KitchenAid and Maytag brand, ENERGY STAR qualified, side-by-side refrigerators use less energy than a 60-watt light bulb. This is more than a 60 percent improvement in energy efficiency since the ENERGY STAR program was introduced 20 years ago. The total production of ENERGY STAR clothes washers, refrigerators and dishwashers made by Whirlpool Corporation in 2011 will save consumers more than $750 million in operating costs each year, when compared to the old products they replaced. That is an astounding $11 billion over the life of these products. The ENERGY STAR program played a pivotal role in creating this opportunity.

Our ongoing commitment to the growth, success and integrity of the ENERGY STAR partnership has been a strong source of pride for Whirlpool Corporation for the last 20 years. Whirlpool is celebrating its 100th anniversary and salutes ENERGY STAR on its 20th. As our company embarks on its next century of "every home...everywhere," there is no end to what our partnership with ENERGY STAR can accomplish for the consumer and the planet.

Whirlpool HOME APPLIANCES

20 Years Contributing to Society and Delivering Consumer Value

Mark Sharp, Corporate Environmental Department Group Manager
Panasonic Corporation of America

Panasonic congratulates the ENERGY STAR program on its first 20 years of raising public awareness and creating a strong brand for energy efficiency. As a leading manufacturer and marketer of an extensive range of electronics products for home, mobile, workplace, and industrial applications, Panasonic has been an active participant in the ENERGY STAR program from its first year and is uniquely positioned to contribute to the program's ongoing success.

Panasonic's partnership with ENERGY STAR mirrors the program's exponential growth; nearly 400 Panasonic products qualify across 11 diverse product categories, ranging from televisions to ventilation fans.

Panasonic has utilized the ENERGY STAR label to effectively market our high-performing yet highly energy-efficient products. The simple, clear message of energy efficiency conveyed by the ENERGY STAR brand has been embraced by consumers, who increasingly seek validation that their electronics are designed with energy efficiency in mind and confirmation that energy efficiency need not be compromised to obtain their preferences in features and design. The ENERGY STAR label provides clear, independent verification of the energy efficiency that today's consumers expect and demand.

Meeting the ENERGY STAR qualification has become a central objective throughout our product design and in our engineering labs that helps bring Panasonic closer to its goal of further reducing our environmental footprint. This accomplishment embodies Panasonic's management philosophy of contributing to society.

Looking ahead toward the 100th anniversary of our company's founding, Panasonic is striving to become the No. 1 Green Innovation Company in the electronics industry by 2018. Long committed to environmental stewardship, ever improving energy efficiency is a key objective in Panasonic's continuing drive toward this goal—helping to further reduce greenhouse gas emissions in the creation, shipment, retailing, operation and, ultimately, end-of-life management of all of our products.

As ENERGY STAR looks ahead to its next 20 years, Panasonic knows that by working together, we can continue to deliver energy-efficient and performance-appealing products to consumers who look to the ENERGY STAR label as evidence that our company's actions are aligned with consumers' fundamental interest in saving energy.

Panasonic

ENERGY STAR Product Retrospective

Residential Lighting

Though credited with the invention of the electric light bulb, Thomas Alva Edison did not actually file U.S. Patent 223,898 until January 27, 1880—75 years after the fundamental technology and principles of electric light were developed. Most early light bulbs were not commercially viable because they did not last very long and were too expensive to produce. Edison's patent was for an improvement in electric lamps—"giving light by incandescence"—and their method of manufacture.[24] After many decades, bulb technology improved significantly and cost decreased. Use in the U.S. began to skyrocket.

The downside to this great American success story is that lighting now uses a great deal of energy—about 12 percent of residential energy consumption goes to lighting—and much of that energy is converted to wasted heat, not light. In traditional incandescent bulbs, which work by heating a filament until it becomes hot enough to emit light, only 10 percent of the energy output produces useful light. The good news is that a growing number of consumers are seeking more efficient ENERGY STAR qualified fixtures and light bulbs to illuminate their homes, lower their energy bills and reduce their carbon footprints.

As with Edison's electric light, much of the growth in more efficient lighting has come through concerted efforts to improve light quality and increase the longevity of efficient lighting options. As demand has grown, prices have decreased significantly, offering an attractive payback for consumers. But as they say, Rome wasn't built in a day...

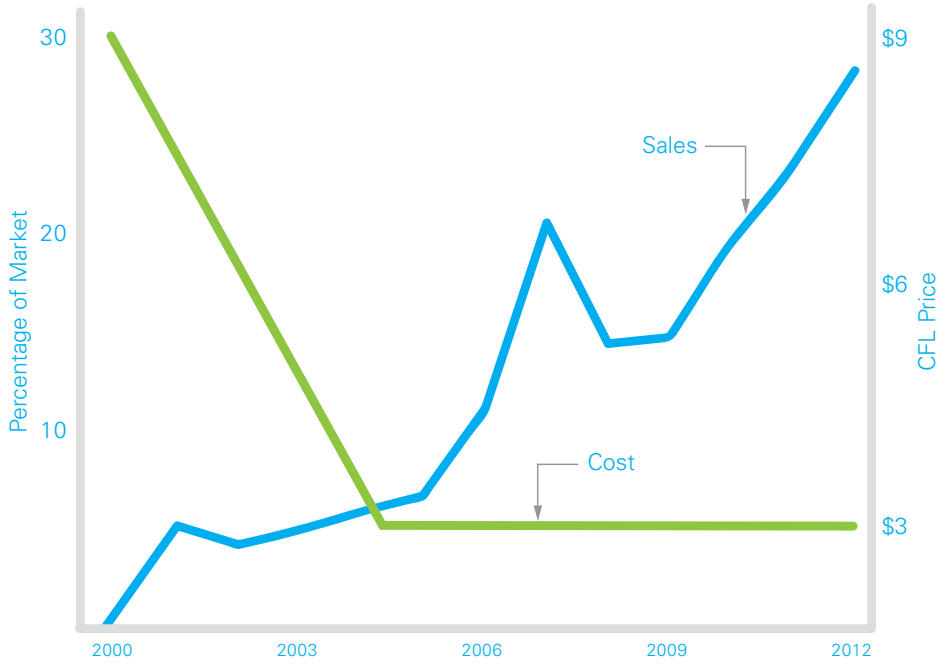
2001
Ann Landers advised readers to look for the ENERGY STAR label when buying lights and electronics.

Like the incandescent bulb, fluorescent lighting was invented long before it became commercially viable. General Electric (GE) bought the patent for fluorescent bulb technology in 1938 and showcased the technology and its superior efficiency at the 1939 World's Fair in New York.[25] While there was some uptake of fluorescent lighting in the commercial sector, due to size, shape, color (the light appeared green) and other factors, early fluorescent lighting was not a great match for most residential applications. The 1970s saw advancements in light bulb design by several manufacturers addressing some of the size and color concerns, and by the late 1980s, utility companies and other energy efficiency program sponsors began promoting CFLs to their residential customers as a way to save energy.

Despite these efforts, light bulb usage had not changed much by the 1990s. CFLs accounted for less than one percent of light bulb sales nationally in 1993.[26] Unfortunately, the early-model CFLs were not quite ready for prime time, with a host of technical challenges including bulkiness, low light output, and inconsistent performance,[27] and they were expensive, averaging $19 each in 1996,[28] according to some studies. Other market barriers identified at the time included:

- Lack of product performance standards to support efficiency claims
- A segmented U.S. lighting industry that saw itself as responding to consumer demand, not creating it
- Lack of consumer awareness and education
- Lack of coordination among manufacturers, utilities and retailers

The ENERGY STAR Difference: CFLs



In the years after CFLs were added to the ENERGY STAR program, an increase in sales led to economies of scale that lowered product costs and brought the purchase price down dramatically. Lower prices and improved performance led to the first peak in sales in 2007, when media attention around the danger of global warming was high. That same year, Walmart sold 100 million CFLs. Today, ENERGY STAR qualified CFLs represent about a quarter of all U.S. light bulb shipments.

2001

An ENERGY STAR specification for residential light fixtures was introduced in 1997, "bringing a benchmark of lighting performance and quality as well as a clearly recognizable brand to the marketplace."[29] The goal was to offer consumers an efficient lighting option with no sacrifice in performance. The initial focus on fixtures was also intended to help address issues such as fit and aesthetics, so the fixture and bulb could be designed in an integrated way.

Working with utilities and other regional energy efficiency programs that hosted educational and bulb exchange events around the country, the ENERGY STAR program and its partners achieved early success with torchieres, the tall floor lamps that direct light upward. Conventional halogen torchieres consumed 300 to 500 watts[30] and were a fire hazard[31]—some events showcased firemen frying eggs on the heat emitted. Efficient ENERGY STAR qualified torchieres did not generate significant wasted heat and were much safer. By September 1999, one million ENERGY STAR qualified torchieres had been sold.[32]

That same year, DOE launched a stand-alone ENERGY STAR specification for CFL bulbs, garnering even greater support from utilities and regional energy efficiency programs given that bulbs were replaced more frequently than fixtures. Similar to the fixture criteria, this specification set the first benchmark for energy efficiency, quality and performance in CFLs and required that all products be tested by an accredited laboratory.

Over the years and through numerous revisions, the ENERGY STAR lighting specifications tackled the full range of performance issues. Limits, now as short as one second, were placed on how long a CFL could take to light up. Sound rating requirements addressed the hum associated with lighting ballasts. Light quality was approached from every angle, including how long it takes the bulb to warm up to full brightness and how many hours of life before the light starts to dim. Another set of requirements helped to ensure that an object illuminated by an ENERGY STAR qualified light would appear the same as it would if it were lit by a standard bulb. Mercury content was limited. And on top of all that, a minimum two-year warranty was imposed. Throughout the process, DOE and EPA focused on using strict performance

standards, but also on working with industry and stakeholders to develop entirely new tests when needed. With each revision to the ENERGY STAR program requirements, the quality of the products increased and consumer satisfaction went up.

To help ensure that lighting products associated with the ENERGY STAR label lived up to these many expectations, a group of utilities, energy efficiency advocates and market transformation organizations formed the Program for the Evaluation and Analysis of Residential Lighting (PEARL). They purchased products from retail stores and tested the performance of ENERGY STAR qualified lighting products being promoted in their various service territories. Performance failures were brought to the attention of EPA and DOE. As a result of this testing, numerous products were removed from the program and enhancements were made to the ENERGY STAR lighting requirements. The U.S. government subsequently initiated its own quality assurance testing for ENERGY STAR qualified lighting.

Nationally, starting in 2003, the number of CFLs shipped to retail stores increased to about 50 million per year, and with that increase manufacturers were able to lower prices. National retailers also played a role in the success of CFLs when Walmart pledged to sell 100 million CFLs in 2007. Today, shipments for CFLs are about 300 million per year; much of the increase in sales is due to the impact that ENERGY STAR and its partners have had on product quality and consumer acceptance.

2007

Another important strategy in market transformation was rallying the market to educate consumers on the substantial benefits of ENERGY STAR qualified lighting. In the fall of 2001, retailers, utilities and manufacturers united around the first-ever nationally coordinated lighting promotion: *Change a Light, Change the World*. More than 100 utilities and other program sponsors, hundreds of retailers, and 25 fixture and bulb manufacturers participated in the promotion, which generated media interest that reached millions of prospective purchasers throughout the country. This nationally coordinated promotion has been the cornerstone of ENERGY STAR product outreach ever since, eventually transitioning to the *Change the World, Start with ENERGY STAR* campaign in 2008 to include additional ENERGY STAR product categories and promotion of energy-saving behaviors.

Today, satisfaction with CFLs is no longer a big concern, with national surveys finding more than 80 percent of consumers "satisfied" or "very satisfied" with CFL performance.[33] Household penetration is also on the rise. In 2009, 68 million households (60 percent) had at least some energy-efficient compact fluorescent or LED lights.[34] Savings from ENERGY STAR qualified CFLs and fixtures are expected to reach 66 billion kWh per year in 2012, reducing annual electric bills by $6.4 billion and greenhouse gas emissions by 46 million metric tons.[35]

DOE introduced an ENERGY STAR specification for LED bulbs in 2010, following the earlier pattern of setting high performance criteria. As efficient lighting choices expand, the ENERGY STAR program remains committed to quality and to ensuring that products meet consumer expectations. A recent *Consumer Reports* article on CFL and LED bulbs found that problems with earlier versions have been overcome and that today's light bulbs "last longer and use far less electricity than traditional incandescent bulbs. Shoppers now have a variety of bulbs to match their needs."[36] *Consumer Reports* also stated that "ENERGY STAR qualified bulbs meet high standards for brightness, color, and energy use."[37] Their buying advice: choose ENERGY STAR.

Pledge to make your next light an ENERGY STAR® at energystar.gov/changealight and join a growing number of people doing their part to preserve energy resources and help reduce the risks of global climate change. It's a small step that will make a big difference for this generation and those to come. **Change a Light. Change the World.**

ENERGY STAR is administered by the U.S. Environmental Protection Agency and U.S. Department of Energy.

ENERGY STAR

2005

GE and ENERGY STAR: A Rich and Beneficial History

Lisa McLeer, Manager of Sales Development and ENERGY STAR Promotions
General Electric

GE Lighting partnered with ENERGY STAR during the development of the first specification for compact fluorescent light bulbs (CFLs) in 1999, and has been promoting the benefits of ENERGY STAR qualified lighting products ever since. Partnering with the ENERGY STAR program was a natural fit for GE. For many decades, GE has invented and sold high quality energy efficient lighting. ENERGY STAR's approach exactly fit this high-quality, high-performance model, offering stringent specifications for products to meet.

In the late 1990s, CFLs were still relatively large, heavy, costly and blinked their way on, eventually warming up to full brightness. In addition, there were many importers—all trying to sell products for lower costs by lowering product quality. This resulted in many products from unknown manufacturers that did not perform or last nearly as long as advertised, tarnishing the image of all CFLs and leading to very slow adoption. Retailers were unsure which products to sell and utilities were unsure which products to rebate. In the beginning, utilities funded third-party testing to prove that products did indeed meet these new specifications—making the program more credible. To try to eliminate poor-quality products, retailers, as well as utilities providing rebates, began requiring the ENERGY STAR label on CFLs, greatly improving overall product quality in the market.

With this new market dynamic, investing in the development of ENERGY STAR products became a key consideration by GE product teams. GE continues this strong commitment today with the development of new energy-efficient LED lighting products that are ENERGY STAR qualified.

The ENERGY STAR program also aligns well with GE's corporate ecomagination℠ initiative started in 2005. Both brands help customers save money on energy, taking into consideration the second price tag of energy costs and other environmental factors. Taking into account both changing ENERGY STAR specifications and ecomagination, GE engineers have developed CFLs that now:

- Are smaller, moving to smaller diameter lamp glass using less material, allowing lamps to fit into more fixtures
- Are longer-lived, increasing lamp life up to 12,000 hours today from 6,000 hours 10 years ago
- Are more efficient with lightweight electronic ballasts
- Start instantly, with no more blinking
- Look like incandescent lamps, with innovative Ship-in-a-Bottle designs using very small ballasts
- Are available in many shades which are tightly controlled so lamp to lamp appearance is uniform
- Are available in specialty and decorative sizes
- Are available in dimming and 3-way options

Over the years, ENERGY STAR marketing campaigns have provided impactful creative platforms for the promotion of energy-efficient products including the *Change the World, Start with ENERGY STAR* pledge. This program has created millions of impressions for GE and ENERGY STAR.

GE has a rich and beneficial history with the ENERGY STAR program. GE plans to continue this partnership, where everyone wins, especially the environment.

ENERGY STAR Product Retrospective

Televisions

An early ENERGY STAR public service announcement (PSA) shows a family sitting at home with an overflowing bowl of popcorn, discussing who will turn on the TV. The husband reluctantly rises from the couch and begins yanking a starter.

"Don't flood it," instructs his wife, as smoke spews from the TV.

This humorous depiction, dubbed "the lawnmower PSA," drew the important link between home appliances and the air pollution they cause. The majority of U.S. electricity is produced by burning fossil fuels, and as a result of energy use, the average home pollutes more than the average car—a statement that surprises many people to this day.

Another surprise for consumers is that many home electronics use power when they appear to be turned off. Research in the late 1990s indicated that consumers paid an estimated $3 billion annually for this "leaking" electricity, with $1 billion of the bill created by TVs and VCRs.[38] Testing by Lawrence Berkeley National Laboratory (LBNL) found that energy use in standby mode varied significantly by model, with TVs using between zero and 12 watts, VCRs using 2–13 watts and TV/VCR combination units using 3–20 watts. It was clear that some products delivered services more efficiently, so the capability was there. It turned out that in many cases the cost of achieving higher efficiencies could be negligible, but it was not a priority for manufacturers. Consumers were not willing to pay more for energy efficiency and it was generally viewed as more profitable to invest design time in improving picture or sound quality.[39] Priorities were about to change.

EPA, TV and VCR manufacturers, industry trade associations including the Electronics Industry Association and the Consumer Electronics Manufacturers Association[40] and other interested stakeholders began working together to develop and launch an ENERGY STAR specification for TVs and VCRs. Announced in January 1998 at the Consumer Electronics Show in Las Vegas, the ENERGY STAR requirements set the bar at three watts in standby mode for TVs, four watts for VCRs, and six watts for combination units. In mid-2005, ENERGY STAR specifications were tightened to require a power draw of less than one watt. By 2008, nearly 80 percent of TVs met these requirements, reducing overall standby consumption by more than seven billion kWh per year,[41] double the annual energy consumption of Washington, D.C.

Despite this success, major trends were emerging that led advocates such as the Natural Resources Defense Council (NRDC) to conclude that, left unabated, TV energy use in the U.S. could increase by 50 percent in five years. These trends included:

- The number of TVs in operation was growing—shipments were expected to increase from 29 million in 2005 to nearly 38 million in 2009.[42]
- Sales of large TVs were on the rise and larger usually meant higher energy use.
- Sales of TVs that required more energy to operate were on the rise. For example, display technology was changing as CRTs (cathode ray tubes) were being replaced by plasma TVs and digital TVs including HDTVs (high-definition TVs). Digital was replacing analog technology.
- Americans were watching more TV per day due to increased programming and video game and DVD use.[43]

2010

During an Earth Day episode of The Ellen Show, 400 audience members received ENERGY STAR qualified televisions from ENERGY STAR partner Best Buy.

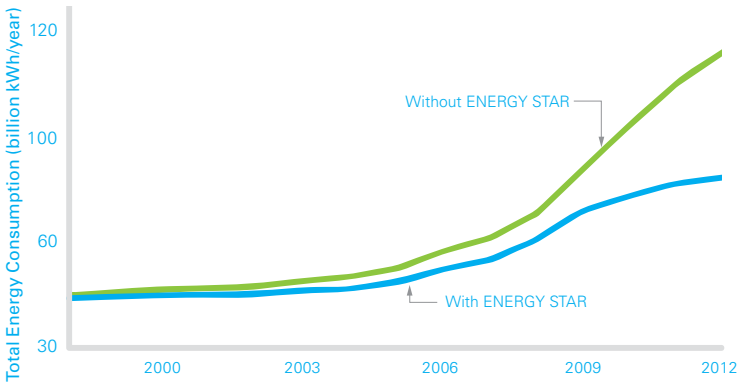
It was clear that the power needed to operate TVs in active use was a significant and growing concern. Analysis conducted by NRDC in 2004, based on off-the-shelf measurements of TV energy consumption, revealed that three key features had a noticeable impact on energy use: screen area, display technology and resolution level.[44] Power consumption was found to vary as much as 40 percent based on the type of image a TV is displaying at a given time,[45] but the test procedure in the U.S. for measuring active power consumption had been developed 30 years prior, for use with black and white, analog TVs.[46] Developing a test procedure that would accommodate new technologies was an essential next step.

EPA began working with the International Electrotechnical Commission (IEC) on a test procedure that addressed active power consumption and could be used as the basis for an updated ENERGY STAR specification. IEC developed the draft international standard in record time and made it available to ENERGY STAR stakeholders ahead of official publication to aid the specification revision process.[47] The standard included a visual test clip for determining average wattage consumed in a simulated real-world setting, when variable dark and bright images are displayed.

Since that time, the ENERGY STAR criteria for televisions have addressed both standby and active mode energy consumption, while accommodating consumer preference for larger screen sizes. Old-fashioned tube televisions have quickly become a thing of the past, replaced by high definition screens powered with LCD (liquid crystal display), plasma, OLED (organic light emitting diode) and other new technologies. The ENERGY STAR specification for TVs has kept pace with technological advances while raising the bar for efficiency three times in the last four years alone, ensuring that TVs offer consumers all the viewing pleasure they seek without exceeding their utility budgets.

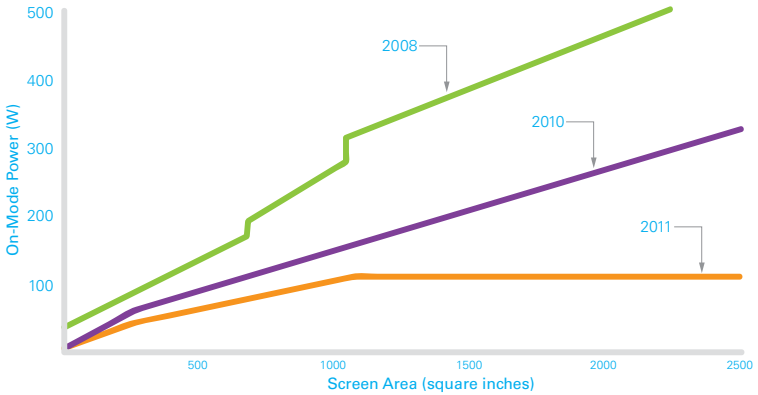
Televisions that meet today's ENERGY STAR requirements are, on average, 40 percent more energy efficient than conventional models, saving American viewers and gamers a total of $3.5 billion per year on their energy bills and preventing greenhouse gas emissions equivalent to those from 4.5 million vehicles.

The ENERGY STAR Difference: Televisions



TV sales and sizes have increased dramatically in the U.S. over the past 20 years—40 million are projected to ship in 2012, with an average screen size of 50 inches. With ENERGY STAR, electricity use for TVs in the U.S. is 36 billion kWh per year less than it might have been.

Changes in On-Mode Power Limits for ENERGY STAR Qualified Televisions



Large gains in efficiency have occurred in the television market over the last few years alone. In 2008, ENERGY STAR qualified large-screen TV models consumed as much as 500 watts while in active mode. Three years later, even the largest ENERGY STAR models consume just over 100 watts.

ENERGY STAR Product Retrospective

Standby Power

Many appliances and electronic devices that appear to be off are actually in standby mode—not providing their primary function, but enabling features such as "instant on," digital clock displays, remote control and preserved user program settings. While each device may consume only a small amount of energy for these features, the environmental impact and costs really add up when one considers that the average U.S. household now owns nearly 24 electronic products.[48] It is estimated that standby power accounts for more than 100 billion kWh of annual U.S. electricity consumption and $11 billion in annual energy costs.[49] While standby power can deliver a range of worthwhile functions, it also can be unnecessarily wasteful because of poor product design, including the use of inefficient components and power supplies.

EPA issued its first energy efficiency specification for standby power in 1998 for televisions, VCRs and combination units. By 2000, France, the Netherlands, Japan and Australia had identified standby power as an energy concern; it was clear that standby power was a global issue that would require multilateral coordination on a test standard, mode definitions and data analysis. The International Energy Agency (IEA) began promoting international efforts to reduce standby power, relying heavily on ENERGY STAR measurements and policies.[50]

EPA worked with representatives from industry and from other countries to develop and later revise the International Electrotechnical Commission's (IEC) standby test standard, IEC 62301. This test procedure provides a common technical basis for the formal and accurate determination of standby power in appliances and equipment around the world. Today, it has been adopted and is in use in many countries. For example, the Chinese government informally adopted the ENERGY STAR TV specification, which includes this standard, in 2002, leading to a five watt per unit reduction in standby power across 40 million TVs.

Standby power is currently addressed for 10 ENERGY STAR product categories, either directly (often with a not-to-exceed requirement of one watt or less) or as part of a total energy consumption metric that simultaneously evaluates standby and active power to ensure overall energy efficiency. The program encourages seamless integration of efficient standby power in ENERGY STAR qualified products. Technological innovation in this area prevents billions of pounds of greenhouse gas emissions every year. With the help of ENERGY STAR, electronics manufacturers across the globe have increased consumer choice while reducing standby power losses in a wide array of residential and commercial products.

You Really Can Have It All

Noah Horowitz, Senior Scientist, Natural Resources Defense Council

Several years ago, I began to notice these new "thinner" TVs with really crisp pictures that were popping up everywhere. Places like hotel lobbies, airport seating areas, health clubs and even my local Japanese restaurant had them, and many were on all the time. Everyone loved these new "digital" or big screen TVs. All indications in the press were that sales would continue to explode, and next year's models would be even bigger.

Given these trends, NRDC conducted the first ever in-depth study on new TV energy use. What we found was that TVs were on more hours per day and, in some cases, were consuming as much electricity as a new refrigerator. The total amounted to around four percent of all residential electricity use. These findings led us to discussions with EPA which, in turn, convinced EPA it was time for ENERGY STAR to address active TV power use in addition to standby (power consumed by the TV when it is off). A global industry effort to develop an on-mode Test Method followed and laid the groundwork for driving down on-mode power use. Now let's fast forward to the massive improvements that have been achieved since then in terms of TV efficiency.

In 2008, consumers saw ENERGY STAR TVs maximized for efficiency in on mode for the first time. These new requirements also discouraged manufacturers from shipping their TVs in "torch mode." Traditionally, TVs were shipped with overly bright settings to ensure they looked good on the brightly lit retail floor. Most consumers however failed to go into the menu to select a more appropriate brightness level for their home, and as a result, TVs in the U.S. consumed 10 to 20 percent more energy than they needed to. ENERGY STAR jump-started industry's shift towards improved setup menus for consumers and away from the brightest possible mode to a mode that is ideal for home viewing.

Next up was the negotiation to significantly accelerate the deployment of more efficient TV designs—things like more efficient backlights, more efficient tuners and power supplies, etc. EPA published a new two-tiered specification creating immediate savings and a national design target for manufacturers to achieve in the future—helping reduce the power use of new TVs by an additional 40–50 percent.

Despite skepticism expressed by industry during the specification setting process, within one year, well over 50 percent of models met the first tier requirements. This transformation was due to a combination of factors, including the availability of financial incentives to retailers by leading utilities such as Pacific Gas and Electric for selling models that met or exceeded ENERGY STAR requirements.

In September 2011, the second tier kicked in early, and as a result we now have 42-inch model TVs on the market that once consumed 400 watts using under 100 watts. That's a whopping 75 percent reduction in power use, and to top it off, the efficient TV has all sorts of new features that the old, inefficient model didn't.

NRDC applauds the EPA and the ENERGY STAR program for helping to transform the TV market. Due in large part to their efforts, U.S. consumers are savings billions of dollars a year on their electric bills, and U.S. emissions of CO_2, caused by powering our TVs and other electronics have been reduced by several million tons annually.

NRDC

ENERGY STAR Product Retrospective

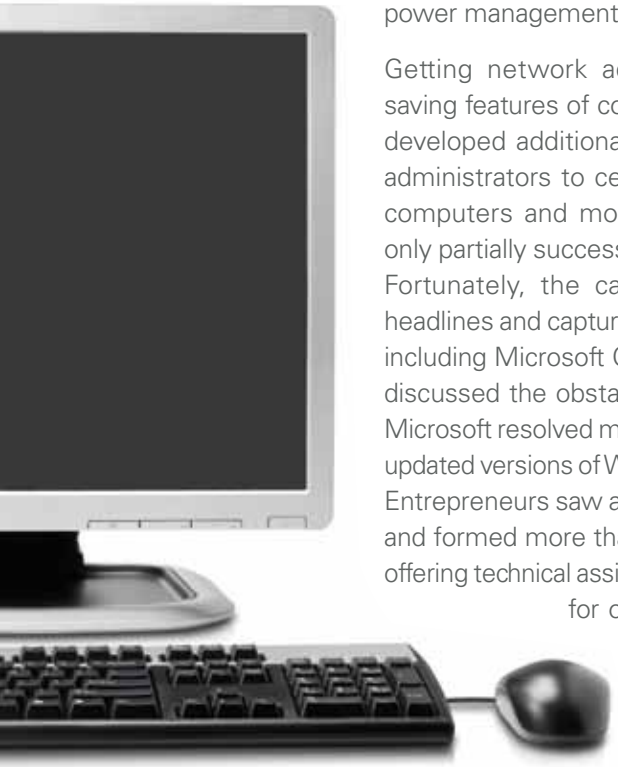
Computer Power Management

Since 1992, ENERGY STAR qualified computers and monitors have had the ability to go into sleep mode, powering down after a period of inactivity. Unfortunately, as corporations began managing computers through centralized networks and computer operating systems became more complex, it became apparent that these features were not being used extensively and, in some cases, were disabled. The ENERGY STAR promise of saved energy and environmental protection was not being fully realized. In 2001, Lawrence Berkeley National Laboratory estimated that only 56 percent of personal computers had power management settings on monitors activated.[51] Key barriers included lack of understanding about the importance of power managing office equipment, as well as inconvenience—it was difficult for network administrators to easily enable sleep settings across their organizations.

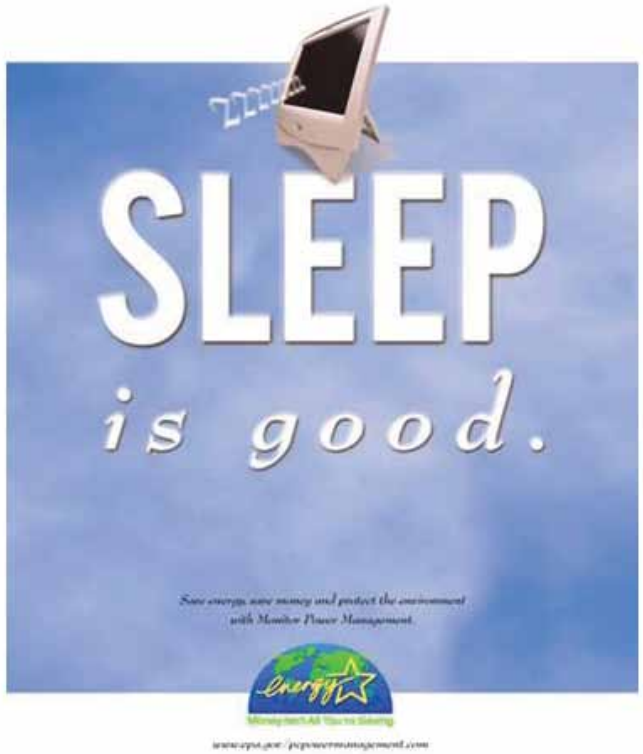
To tackle these challenges, EPA launched the *Million Monitor Drive* campaign in 2001, focusing on monitors because they generally consumed more energy than computers and because IT managers were more amenable to power managing them. The campaign included public events, media outreach and direct outreach to large, computer-intensive organizations. The goal was to activate the sleep setting in one million monitors the first year. The campaign went a step beyond typical program offerings by providing technological solutions—a free software tool developed by DOE called *EZ Save* that allowed network administrators to manage power settings from a central server and companion, web-based software, *EZ Wizard*, which allowed individuals to activate monitor power-saving features in mere seconds.

Offering a set of "Sleep is Good" themed materials to help educate corporate executives, IT managers and computer users, the ENERGY STAR *Million Monitor Drive* gathered pledges to change from a wide range of organizations: large corporations such as Ford Motor Company, General Motors, General Electric, Wells Fargo, Citigroup and Boeing; schools and universities including Fairfax County public schools in Virginia, New York City Department of Education and Harvard University; and more than 50 state, county and municipal governments across the nation. Less than four years later, 6.4 million monitors had been power managed, saving an estimated 660 million kWh, and significantly exceeding campaign goals.

In 2008, this effort evolved into the *Low Carbon IT* campaign, with a focus on computer power management and other IT equipment. The ENERGY STAR website became a hub of technical information about power management.



Getting network administrators to manage the power-saving features of computers proved more challenging. EPA developed additional software, *EZ GPO*, to allow network administrators to centrally manage sleep settings for both computers and monitors, but the technical solution was only partially successful due to operating system limitations. Fortunately, the campaign continued to make national headlines and captured the attention of Microsoft executives, including Microsoft Chairman, Bill Gates. EPA and Microsoft discussed the obstacles to broad power management, and Microsoft resolved many of the outstanding technical issues in updated versions of Windows. Momentum grew in other ways. Entrepreneurs saw an opportunity with energy management and formed more than a dozen private software companies, offering technical assistance and power management solutions for organizations. Utility programs began to offer incentives for organizations to power manage their IT equipment,



and in 2007, President Bush issued an Executive Order requiring that all federal agencies power manage their computers and monitors.

Today, approximately 95 percent of office monitors[52] and 25 percent of office desktop computers[53] have power management features enabled, saving more than 10 billion kWh per year and preventing greenhouse gas emissions equivalent to those from 15 million vehicles.

ENERGY STAR Product Retrospective

Refrigerated Vending Machines

Scene 1 INTERIOR GYMNASIUM - POST GAME

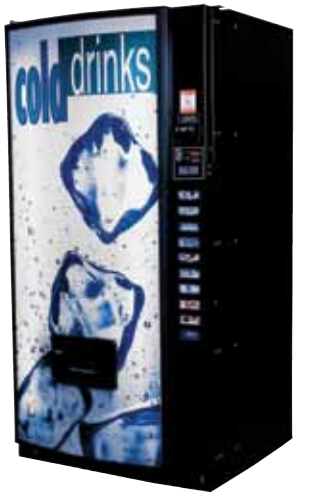
Click, ka-chunk, aaah—the sound of a soda can being dispensed from a vending machine and opened for enjoyment by star athlete, who relishes icy cold beverage.

Scene 2 INTERIOR GYMNASIUM - LATE, LATE NIGHT

Pan to fully illuminated vending machine—owned, operated and maintained by beverage bottler or independent machine operator anxious to maximize sales and avoid service calls.

Scene 3 INTERIOR OUTDATED SCHOOL ADMINISTRATIVE OFFICE - EARLY MORNING

Close-up of utility bill paid for by the school where the machine is located. A coffee cup is knocked over and coffee spills out and begins to saturate bill. Fade out.



Perhaps not the making of an Academy Award-winning screenplay, but the scenario—all too familiar to the efficiency community—demonstrates that there are often split incentives to greater efficiency. In this case, the star athlete has no reason to think twice about the vending machine she used to purchase her soda, the machine owner is not responsible for paying the utility bill and therefore has little reason to be concerned about its efficiency, and the school administrator who does pay the electric bill has no way of linking energy use to the vending machine.

Behind the scenes, EPA, DOE and efficiency advocates were working to identify strategies to revise the script. An energy-efficient vending machine working group, consisting of representatives from the Natural Resources

2009
ENERGY STAR made David Letterman's Top 10 list on The Late Show.

Defense Council, EPA, DOE and its national laboratories, the American Council for an Energy-Efficient Economy, the California Energy Commission and the Consortium for Energy Efficiency, was formed with the goal of forging a path to transform the efficiency of refrigerated vending machines.[54] Fortunately, several important foundational elements were already in place:

- The Canadian Standards Association (CSA) had established measurement procedures and voluntary maximum daily energy consumption levels for beverage vending machines.
- The American Society of Heating, Refrigeration and Air Conditioning (ASHRAE) had developed a related test procedure that would allow for comparison of energy performance (though the results were not published in one place or readily available to end users).
- There appeared to be several cost-effective ways for manufacturers to improve the efficiency of their machines. Those changes might appeal to end users if they were aware of operational cost savings, though it was believed that distributors would balk at any improvement that added even minimally to machine costs.[55]

At the time the working group was formed, lighting, which is important in vending for attracting potential customers, represented about 30–40 percent of the total energy use. Machines were frequently illuminated all day and night, even when no one was around to see the machine or purchase a beverage. More efficient fluorescent lighting was available but not produced in an optimal size for vending machines, partially due to lack of demand. A number of low-cost technologies, such as timers and motion detectors, could be used to turn off lights when they were not needed. Energy waste associated with refrigeration could be addressed using more efficient evaporator and condenser fan motors, compressors and insulation.[56]

As these various options were considered, it turned out there were some non-energy benefits associated with improved lighting technology that appealed to distributors—the efficient lighting would last longer, reducing the need for service calls. What's more, brand new machines represented only a slice of the market and the energy efficiency potential. While machines typically lasted 10 years or more, they were often shipped to refurbishment centers for an overhaul within three to four years.[57] As a result, new machines were built with modular components and were good candidates for upgrades with efficient components.

EPA officially launched the ENERGY STAR label for refrigerated beverage vending machines at the National Automatic Merchandising Association Spring Expo in April 2004. The specification ensured that ENERGY STAR qualified new machines would be 35 percent more efficient than machines that were commonly available at the time,[58] and would deliver additional savings (50 percent more efficient than commonly available) in less than three years. Once the details were worked out, rebuilt machines became eligible for ENERGY STAR qualification in August 2006.

When the ENERGY STAR specification was first launched, typical refrigerated vending machines were using as much as 13–15 kWh per day—or about five times the amount of a typical household refrigerator—and those paying the energy bills had no way to easily identify and request more efficient machines in their vending contracts. The ENERGY STAR designation enabled them to say, "we care about the environment and our electric bill and only want ENERGY STAR qualified models installed on our property." In just a few years, vending-machine manufacturers were introducing ENERGY STAR qualified models that reduced energy consumption by more than 50 percent. Today, ENERGY STAR qualified vending machines use only 3–7 kWh per day,[59] and commitments by major end users such as Pepsi and Coke to upgrade existing machines quickly, have brought the installed base to more than one million ENERGY STAR qualified machines.[60]

In August 2012, federal minimum efficiency standards take effect for new refrigerated beverage machines, locking in savings of approximately $150 annually for each vending machine. When all vending machines are performing at this standard, the current ENERGY STAR level, the savings will exceed 5.5 billion kWh per year, preventing four million metric tons of greenhouse gas emissions.

FADE IN AUDIO – APPLAUSE.

ENERGY STAR Product Retrospective

External Power Supplies

On the path to our homes from the power plant, electricity travels across transmission lines as high-voltage alternating current (AC), which is then reduced by our utility distribution company until it magically emerges from the wall socket as 120/240 volts AC, capable of powering any device with a standard two- or three-pronged plug. But some electronics and battery-charged tools require a much lower AC or finely regulated direct current (DC) to operate; you can tell which these are by the power adapter or external power supply (EPS) at the end of the cord. There are more than three billion EPSs in use in the U.S. today.

One of the reasons EPSs are so popular is that they allow end-use product manufacturers to save time and money on Underwriter Laboratories (UL) safety listings, since the voltage reduction and AC-DC power conversion occurs outside the end-use product. External conversions allow for modular designs, and modular designs mean a commoditized market. About 900 million EPSs are shipped annually[61] for domestic use, with thousands of manufacturers worldwide competing for customers, often by offering the lowest price.

For years, these EPSs were known as "energy vampires." They performed their function very inefficiently, sucking energy unnecessarily when the products for which they were intended were turned off, already fully charged, or even removed from the EPS. Much of the power entering the EPS was lost as wasted heat, with only a portion of it going to operate or charge the product. In 2002, typical energy efficiencies ranged from 15–80 percent when devices were in active use; energy losses when products were plugged in but not in use ranged from less than one watt to about four watts.[62]

Given the great variability in energy consumption for EPSs, it was obvious that there were more efficient ways to convert energy. However, the most efficient technologies were typically reserved for high-end, higher wattage products or portable devices. The majority of power supply products, particularly those using 20 watts or less, were on the low end of the performance spectrum. End-use manufacturers, who often compete on high volume with low profit margins, were concerned about costs. Cost premiums for more efficient EPSs ranged from a potential 10–30 percent, and changing to a different EPS could trigger design changes and delay production. What is more, efficiency or lack thereof was invisible to both the end-use manufacturer and the ultimate consumer—EPSs were labeled only for the maximum power draw and maximum current they could provide at a given voltage.[64] Therefore, energy-efficient EPSs might be difficult to market.

Recognizing the global nature of both supply and demand of EPSs, EPA began working with stakeholders in the U.S., China, Europe, Canada and Australia to explore ways to encourage improved efficiency. In addition to needing a standard test method for measuring AC-DC power supply efficiency, which the California Energy Commission was instrumental in developing,[65] manufacturers would need an easy way to specify and identify power supply efficiency in the wide variety of markets in which they operated. Stakeholders worked together to devise a marking protocol that could be used around the

2011

In the U.S. there are approximately 250 million products that make use of a battery charger. ENERGY STAR qualified battery chargers have the potential to save Americans more than 1.5 billion kWh of electricity, or more than $170 million annually.[63]

world by any country interested in EPS efficiency, and provide an easy to understand system for power supply manufacturers, finished product manufacturers and government agencies.

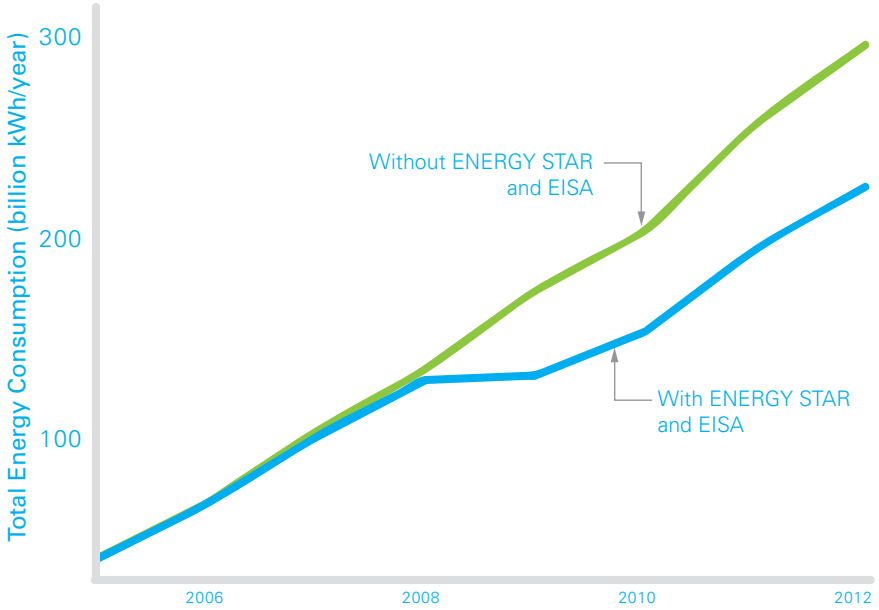
The International Efficiency Marking Protocol, which was designed to be printed on the power supply nameplate, designated the minimum performance of an EPS using Roman numerals I through VII, with I being the least efficient and VII being the most efficient—with higher numerals reserved for future, more efficient products. The marking protocol became a key element of the ENERGY STAR EPS specification.

Launched at the International Consumer Electronics Show in January 2005 and at the Applied Power Electronics Conference and Exposition in March 2005, the ENERGY STAR EPS specification was a cost-effective way to address energy waste across the broad range of products powered by EPSs but not otherwise covered by the ENERGY STAR program.[66] While the traditional ENERGY STAR label would not appear on the product, end-use product manufacturers were encouraged to use a version of it, indicating that their product was "powered by an ENERGY STAR qualified adaptor for a better environment" as a way to differentiate their products in the marketplace.

By 2008, the market share for ENERGY STAR qualified EPSs had reached an estimated 50 percent, delivering savings of five billion kWh per year and annual greenhouse gas reductions of one million metric tons. That same year, a minimum efficiency standard went into effect in the U.S. mandating the ENERGY STAR performance level, and a more stringent ENERGY STAR specification was introduced.[67]

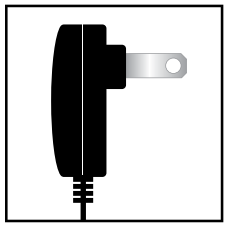
Today, energy use associated with EPSs nationally is estimated to be 70 billion kWh per year less than it would have been had EPS energy performance stayed where it was in 2005—a savings equivalent to the greenhouse gas emissions of more than nine million vehicles.[68] EPA officially retired the ENERGY STAR specification for EPSs on December 31, 2010, but continues to advance power supply efficiency through a growing list of ENERGY STAR products that require highly efficient EPSs as a part of broader energy performance requirements.[69]

The ENERGY STAR Difference: External Power Supplies



EPA estimates there are approximately 11 external power adapters for every person in the U.S.—as many as 3.4 billion in total. Thanks to the combined effect of ENERGY STAR and minimum efficiency standards set by the Energy Independence and Security Act of 2007 (EISA), energy use in the U.S. associated with external power supplies is estimated to be 70 billion kWh per year less than it might have been.

ENERGY STAR



Powered by an ENERGY STAR® qualified adaptor for a better environment

ENERGY STAR Product Retrospective

Digital-to-Analog Converter Boxes

Before 2008, few of us knew what a digital-to-analog converter box (DTA) was. For Americans who had cable or satellite services or newer televisions with built-in digital tuners, there was little reason to find out. But the estimated 16 to 22 million Americans who did not subscribe to cable, who owned an older, analog TV, and who could not afford or did not want to buy a new one would have to install a DTA before June 2009—when the United States converted to all-digital broadcasting—in order to stay connected to programming.[70]

A new DTA was projected to cost about $50 to $60. To ease the transition, Congress stepped in to make $40 rebates available through the National Telecommunications and Information Administration (NTIA). But, unless energy use for these new devices was taken into consideration, those who were most likely to need DTAs would be least able to afford increased utility bills.

Fortunately for these consumers, EPA had already initiated a stakeholder process to develop an ENERGY STAR specification for DTAs. These products were virtually unknown and unavailable in the U.S. market. So EPA invited potential DTA manufacturers and resellers, component providers and other interested parties to discuss state-of-the art options for digital chips that could perform key DTA functions more efficiently than what was then available in the worldwide marketplace. Domestically, California had established an ambitious state efficiency standard for DTAs that was being challenged.[71] Some industry experts had estimated that a product capable of meeting such strict efficiency standards would cost the consumer more than twice the amount anticipated for a conventional DTA.[72] Lack of anticipated demand, small production quantities and a limited production cycle also were cited as likely contributors to the higher price tag. If EPA and stakeholders could coalesce around an ENERGY STAR specification, then market demand and support for efficient DTAs nationally could help increase production and drive down the purchase price for a more efficient option. What they needed to agree on were operational definitions such as "on," "off" and "standby" modes, a standardized procedure for testing power consumption in each mode and criteria that would set aggressive efficiency targets, offer the same or better performance as conventional options and ultimately be cost-effective for consumers.

EPA and its stakeholders concluded the development process in record time, agreeing on a specification effective January 31, 2007. The specification required DTAs to automatically power down after extended periods of inactivity. It set efficiency criteria of less than eight watts in "on" mode and less than one watt in "sleep" mode—cutting the energy use of DTAs by more than 70 percent compared to products available in the worldwide marketplace.[73] When NTIA released its final rule launching the DTA Coupon Program, they included requirements that DTAs "comply with standards established by the EPA ENERGY STAR program or state regulatory authorities."[74]

Eight manufacturers produced more than 40 different DTA models, selling an estimated 14.2 million ENERGY STAR qualified DTAs.[75] As a result, Americans are saving about two billion kWh of energy and avoiding about $250 million in energy costs over the life of these products.[76]

2011

The 160 million set-top boxes installed in the U.S. consumed enough electricity to power all the homes in the state of Maryland.[77] When every set-top box meets ENERGY STAR requirements, Americans will save about $1.8 billion per year and prevent greenhouse gas emissions equivalent to those of 2.3 million cars.[78]

ENERGY STAR as a Market Transformation Strategy

Steven Nadel, Executive Director, American Council for an Energy-Efficient Economy

I remember when I first heard about ENERGY STAR. It was in the early 1990s, and I was on a plane with then EPA Branch Chief Cathy Zoi, who told me about an idea they were kicking around. It involved putting labels on personal computers that had power management features, and they were thinking of calling it ENERGY STAR. This concept soon moved forward, starting with personal computers. Manufacturers embraced the concept and soon more than 90 percent of personal computers had power management features—an amazingly quick transformation of the market. Since then the ENERGY STAR specification for personal computers has been revised multiple times. Each time, manufacturers have responded by redesigning the majority of their products to meet the ENERGY STAR requirements. As a result, the typical personal computer and monitor now use about 230 kWh per year, about half of what they would have consumed had no changes in efficiency occurred, even though today's machines are much more powerful than those from the early 1990s.

ENERGY STAR has similarly transformed many other markets. When flat-screen televisions first reached the market, most were "energy hogs" and many used more than 600 kWh of energy per year—more than a new refrigerator. But the ENERGY STAR specification set limits on energy use and has been progressively tightened. Today, a typical 42-inch ENERGY STAR qualified flat-screen TV is down to 150 kWh per year. Likewise, ENERGY STAR has helped transform the market for residential windows. When the program for windows began with DOE in 1998, most new windows did not insulate well or block excess heat during the summer. ENERGY STAR window performance requirements have resulted in better performance and greater comfort for residents. And to provide just one more example: for many home appliances, manufacturers design products to meet ENERGY STAR specifications, and due to consumer interest in ENERGY STAR, these products steadily grow in market share. As market share increases and prices decline, what were once ENERGY STAR levels can be used as the basis of minimum energy efficiency standards, and ENERGY STAR can be reset for even higher levels of efficiency. As a result, clothes washers and refrigerators today typically use half the energy that units from the early 1990s did.

Given this track record over the past 20 years, ENERGY STAR is well poised to continue transforming markets in the decades to come.

ACEEE
American Council for an Energy-Efficient Economy

The Future of ENERGY STAR Certified Products

Big Strides, But More Products Mean More Opportunity for Savings

What a different world we find ourselves in 20 years later. In that span of time, we have seen the energy use of so many devices cut in half, or even better. But even as energy efficiency has improved substantially, home energy demand continues to climb nationally. This increase in consumption can be tied in part to the growing number of energy-using products that we all enjoy. Just think of the many devices you have at your disposal and what they can do for you—communicating, computing, displaying, life organizing, as well as juicing, frothing, and fresh-bread producing. Even the tried-and-true classroom blackboard is now electronic and connected to the Internet. By 2020, miscellaneous products—all these new gadgets—will account for about 30 percent of electricity use in U.S. households.[79] And that means that there is plenty more for the ENERGY STAR program and partners still to accomplish.

Sleep is Still Good, But Products Need to Put Themselves to Bed

Energy efficiency in the future is all about making savings an automatic feature of rapidly evolving, sophisticated new technologies. ENERGY STAR certified products will increasingly behave intuitively when it comes to power management. Rather than relying on users to turn off a growing number of products and all of their accessories, these products will aggressively use power management to preserve battery life or drastically reduce electricity draw when not in use, and then wake promptly when called to action. Transfer of well-tested functionality to products not traditionally known for power management will remain a cornerstone of the program.

By the same token, as more and more products offer networked functionality—displays, TVs, and even appliances now, not just computers—there is no reason for these products to stay on all the time to receive network information. The ENERGY STAR program can play an important role, leveraging recently published standards, to ensure that more and more products drop off to sleep and then wake seamlessly in response to a network call. Being tethered to the network also has the promise of furthering intuitive behavior for products. Sensors are beginning to power products down automatically when there is no one in the room, and home energy management systems are poised to maximize energy savings when no one is home. Going forward, the ENERGY STAR program will remain a champion for this kind of energy-saving functionality in products.

Squeezing Out Every Last Drop

After 20 years, delivering additional savings from the existing suite of ENERGY STAR products raises opportunities and challenges the program is poised to tackle. A dishwasher sold today will use about half as much energy as the average dishwasher sold 20 years ago,[80] but it still needs to clean the dishes. TVs that use very little energy must always deliver vibrant images. With high-quality performance as a priority, and thanks to a remarkable tradition of innovation on the part of manufacturers, there are advances yet to be made and more energy savings to deliver.

Sometimes new approaches will be needed. Heating and cooling, for example, still represent nearly half of home energy costs despite significant progress in energy efficiency. Getting more out of this category may require setting regional, climate-based efficiency requirements to ensure that the biggest savings are targeted for areas with the best return on investment. Diagnostics, communication features and improved user interfaces will be increasingly important to enable consumers to maximize savings. Products such as programmable thermostats can deliver enormous consumer and environmental savings—if used properly. Usability standards, like the one EPA is developing for residential climate controls, could turn out to be an important testing ground for improving the usability of a broad range of energy-saving products.

2011

The Reliable Source for Energy Savings Information

For many Americans, looking for the cyan star will continue to be the simple way to save energy, save money and help prevent climate change. For others, the ENERGY STAR program is increasingly the source of credible advice and information for reducing energy consumption in their homes and businesses. Consumers and companies trying to navigate increasingly complex purchase decisions—from buying a light bulb to specifying a data center server—can count on ENERGY STAR to give them access to information in an easy-to-use format. And for those who are ready to take the next step, the program offers an ever-expanding collection of energy-saving behaviors, advice and tools developed using the same rigor applied to defining product efficiency.

Encouraging the development of products that use less while doing more, that are more and more intuitive and usable, along with fostering an action-oriented ethos around saving energy, are investments that will continue to pay off for Americans and the environment. The ENERGY STAR program remains up to the task.

Endnotes

1 Manufacturers providing input into initial program development for ENERGY STAR computers: Apple Computer, Inc., Compaq Computer Corporation, Digital Equipment Corporation, Hewlett Packard, IBM Corporation, NCR/AT&T, Smith Corona Corporation, Bull Information Systems.
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