



ENERGY STAR

MAINTAINING THE VALUE OF ENERGY STAR®

2007 Report



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Executive Summary

The ENERGY STAR identity is a valuable asset, and like any asset with appreciable value, it must be properly used and protected. The U.S. Environmental Protection Agency (EPA) and U.S. Department of Energy (DOE) undertake substantial efforts to ensure 1) that the ENERGY STAR name and marks are applied properly and consistently in the marketplace; 2) that ENERGY STAR delivers on its promise to designate products and services that protect the environment through superior energy efficiency while achieving superior energy efficiency without trade-offs in performance or quality and offering attractive financial payback on any additional initial purchase costs; and 3) that the program is positioned to deliver growing energy savings and related environmental benefits for years to come. The following are ways in which EPA and DOE establish and maintain control over the use of the ENERGY STAR name and marks:

- Entering into Partnership Agreements with product manufacturers, retailers, energy efficiency program administrators, builders, and others, which specifically outline the terms and conditions for using the ENERGY STAR name and marks (also called logos)
- Issuing ENERGY STAR program identity guidelines to program partners and third parties to ensure proper use of the logo
- Monitoring the use of the name and marks in trade media, advertisements, the Internet, and stores
- Responding when consumers, competitors, program partners, and others bring possible trademark infringements to the attention of EPA or DOE
- Verifying the energy performance of products and homes through product testing
- Requiring product manufacturers to report qualification test results, which are reviewed and approved or disapproved
- Assessing consumer experience with and perceptions of ENERGY STAR when purchasing or shopping for qualified products and services
- Updating performance specifications as needed (e.g., when high levels of market penetration are reached; underlying reference standards are revised; there are substantial changes in technology, features, and functionality, etc.) to ensure that the ENERGY STAR designation remains meaningful in the marketplace

EPA protects the ENERGY STAR brand through formal registration of the name and trademark with the U.S. Patent and Trademark Office, through formal agreements with other government agencies and program partners governing use of the trademark, by providing written guidance on the proper application and use of the ENERGY STAR name and logo, and by actively monitoring its use in the marketplace. Today the program has active licensing or Partnership Agreements with more than 12,000 partners, including:

- 2,000 manufacturers
- 1,000 retailers
- 5,000 building partners
- 550 utilities, states, and other energy efficiency program administrators
- Hundreds of energy service providers
- 7 international governments or unions

These organizations work with EPA and DOE to promote ENERGY STAR as a solution for reducing greenhouse gas emissions through increased energy efficiency. These partners play a vital role in

delivering ENERGY STAR qualified products and services to market and/or educating diverse constituents on the energy, environmental, and financial benefits of choosing ENERGY STAR.

With a large and diverse network of partners delivering ENERGY STAR products and messaging to market comes a number of challenges to maintaining the integrity of the ENERGY STAR name and logos. EPA and DOE track appropriate use of the name and logo through a variety of methods, including monitoring media, responding to trademark issues raised by third parties, and verifying energy performance. There are formal protocols for dealing with potential trademark infringements, which are actively pursued until issues are resolved. Trademark violations as a percent of total companies advertising in print is negligible—estimated at less than 1 percent of advertisers in 2007 (0.66 percent)—and misuse as a percent of total advertising volume is also low—estimated at less than 2 percent of advertising volume in 2007 (1.35 percent).

All ENERGY STAR specifications criteria are based on strict performance criteria with clearly defined test procedures. Manufacturers are required to report qualification test results to EPA and DOE, which are reviewed and approved or disapproved. In addition, EPA verifies energy performance through its Compliance Audit Program. There are three key components to this Program:

1. **EPA verification testing, which is administered by EPA using third-party independent laboratories.** To date, EPA has tested 10 product categories and 172 product models. Of all models tested to date, three failed compliance testing. Failures were addressed in a timely fashion by the program.
2. **Third-party testing, administered by external, independent organizations.** This testing approach is relevant to products tested under certification programs, as well as products reviewed independently by organizations.
3. **Quality assurance testing for lighting products.** To date, this approach is only used for residential light fixtures (RLFs); however, DOE has developed a similar program for compact fluorescent light bulbs (CFLs), which will begin when the revised CFL criteria takes effect in December 2008. Ten RLFs and 12 lamp and ballast platforms were tested by EPA in 2006 and 2007 as part of the quality assurance testing program. Two fixtures and two platforms have been removed from the Qualified Product List (de-listed) as a result of failures. Both the fixtures and CFL quality assurance testing programs evolved out of a third-party testing program known as the Program for Evaluation and Analysis of Residential Lighting (PEARL), which has been funded by both federal agencies and partner energy efficiency programs to perform off-the-shelf testing of ENERGY STAR lighting products. Under PEARL, 62 CFLs were tested in 2006 and 2007 and 13 CFLs have been de-listed as a result of failures.

To understand how ENERGY STAR is perceived by consumers and presented to them in the marketplace, EPA analyzes household recognition of, understanding of, use of, and loyalty to ENERGY STAR labeled products and homes once each year; and it evaluates sales staff knowledge and use of ENERGY STAR messaging in major retail outlets twice each year. Today, more than 70 percent of households nationwide recognize the ENERGY STAR label, more than 76 percent of these households correctly interpret the meaning of the ENERGY STAR label, and approximately 5 out of 6 of these households report they are likely to recommend ENERGY STAR products to friends. Furthermore, from 2001 to 2007, retail staff using ENERGY STAR as part of the sales process has increased across a number of product categories.

To ensure that the ENERGY STAR label continues to differentiate top energy performance in the marketplace and captures additional energy-savings opportunities as appropriate, EPA and DOE regularly screen and prioritize opportunities based on formal guiding principles for specification

development. These efforts have resulted in revisions to existing ENERGY STAR specifications, sunseting or suspension of some specifications, and the introduction of new specifications with considerable energy and environmental benefits. Since the program's inception in 1992, more than 50 product and service categories have been added to the ENERGY STAR suite. In addition, numerous specifications have been updated to achieve additional energy and performance benefits. This report shows that new ENERGY STAR specifications for six product categories are in the process of being developed and 15 existing product specifications are in the process of being updated.

EPA and DOE also have a significant commitment to pursuing both the voluntary and required data submission provisions of some Partnership Agreements. Tracking the market share of ENERGY STAR qualified products helps inform future specification revisions and program progress in delivering energy savings and related greenhouse gas emission reductions. In 2006, more than 90 percent of manufacturing partners who had mandatory requirements for market data submission provided the required data.

In sum, EPA and DOE undertake substantial efforts not only to monitor the application and use of the ENERGY STAR trademark, but also to ensure that ENERGY STAR delivers the energy and environmental savings inherent in the ENERGY STAR promise. By consistently presenting the meaning and benefits of the ENERGY STAR label, EPA and DOE maintain and build the label's value which immeasurably benefits all. Americans, with the help of ENERGY STAR, prevented 40 million metric tons of greenhouse gas emissions in 2007 alone—equivalent to the annual emissions from 27 million vehicles—and saved about \$16 billion on their energy bills. Savings are on track to nearly double in 10 years as more households, businesses, and organizations rely on ENERGY STAR for guidance in investing in energy-efficient products and practices.

This report is presented in six main sections and provides additional detail on these efforts:

- Section I provides an overview of the ENERGY STAR program and trademarks.
- Section II summarizes the information that is collected and the processes used to maintain the integrity of the ENERGY STAR label across trade media, the Internet, advertisements, and stores.
- Section III summarizes the processes that are used to qualify products and homes and verify energy performance.
- Section IV summarizes the information collected and the methods used to assess consumer perceptions of and experience with purchasing ENERGY STAR qualified products, homes, and services.
- Section V provides a review of the criteria that EPA and DOE use when selecting products that can earn the ENERGY STAR and summarizes the general principles used to prioritize specifications for revision. It also details specifications that have been revised or will soon be revised to ensure product quality and performance differentiation in the marketplace, as well as prospective revisions and new product categories being considered.
- Section VI summarizes the efforts EPA is undertaking to ensure partners comply with the data submission requirements of the Partnership Agreement.

New elements addressed in this report include:

- Expanded discussion on how EPA verifies energy performance through its Compliance Audit Program, which includes EPA verification testing, third-party testing, and quality assurance testing for lighting products (Section III).
- Expanded discussion of the criteria that EPA and DOE use to ensure consistency when selecting products that can earn the ENERGY STAR (Section V).

Introduction

The ENERGY STAR brand is a valuable asset, and like any asset with appreciable value it must be properly used and protected. This report documents how the U.S. Environmental Protection Agency (EPA) and U.S. Department of Energy (DOE) work to ensure the integrity of the ENERGY STAR program and the proper use of the ENERGY STAR trademark. It focuses on the practices and processes used to ensure that labeled products, new homes, and home improvement services are properly represented in the marketplace and are positioned to deliver meaningful energy savings and related environmental benefits. It does not address the procedures for EPA's effort in the commercial and industrial sectors, which are similar in many cases and may be added at a later time.

This report also addresses the legal mechanisms for protecting the ENERGY STAR trademark and summarizes the efforts both agencies undertake to ensure that those protections remain fully enforceable in a court of law should the need arise. Additionally the report addresses questions of relevance and preference: Is the ENERGY STAR label useful to consumers? How is it being used by retail partners in the marketplace to communicate energy-efficient and environmentally-preferable products? In addition, given the success of the program in achieving high levels of market penetration for many product categories, what efforts are undertaken to ensure that the ENERGY STAR label continues to differentiate top energy performance and is leveraged to address new technologies and opportunities for additional energy savings and environmental benefits moving forward?

The report is divided into six main sections:

Section I provides an overview of the ENERGY STAR program and trademarks, including the following:

- The statutory basis of the program and program history
- An overview of the program's registered trademarks and the legal protections of trademark registration
- An overview of the methods that EPA and DOE use to maintain trademark protection and program integrity
- The scope and nature of current licensing or Partnership Agreements that allow others to use the ENERGY STAR name and logos under certain conditions

Section II addresses the following methods that EPA and DOE employ to monitor appropriate use of the ENERGY STAR name and logos and discusses the actions the agencies undertake when violations occur:

- Monitoring print advertisements, the Internet and domain names, and print article content, as well as responding to potential trademark infringements raised by third parties
- Assessing in-store use of the ENERGY STAR name and marks on products, packaging, and signage at retail locations

Section III addresses the methods that EPA and DOE undertake to qualify products and homes and verify energy performance, as well as the process EPA and DOE employ for handling mislabeled products. These include:

- Providing clear performance requirements

- Requiring manufacturers to report testing results in order to qualify for the ENERGY STAR label
- Auditing compliance through EPA verification testing, third-party certification testing, and quality assurance testing for lighting products
- Following an established response protocol in addressing product mislabeling

Section IV addresses the efforts and key findings of EPA efforts to assess the consumer experience with and perceptions of ENERGY STAR, including the following:

- An annual assessment of the household recognition of, understanding of, use of, and loyalty to ENERGY STAR labeled products and homes
- A semi-annual evaluation of sales staff knowledge and use of ENERGY STAR messaging in retail settings

Section V discusses the program's procedures for introducing new products and services, as well as the process for revising ENERGY STAR specifications to ensure that they remain meaningful in the marketplace. In addition, detailed charts are provided for the following:

- Consistency Review of ENERGY STAR products against the program criteria
- Revisions to product specifications to date
- Revisions to homes specifications to date
- Specifications currently being revised or assessed for potential ENERGY STAR label eligibility

Section VI discusses the procedures EPA and DOE undertake to ensure compliance with market share data submission requirements, which vary by partner type. Information is provided for the following:

- Manufacturer shipment data
- Retailer sales data

In sum, EPA and DOE undertake substantial efforts not only to monitor the application and use of the ENERGY STAR trademark but to ensure that ENERGY STAR delivers the energy and environmental savings inherent in the ENERGY STAR brand promise. Consistently presenting the meaning and benefits of ENERGY STAR maintains and builds its value and immeasurably benefits all. Americans, with the help of ENERGY STAR, prevented 40 million metric tons of greenhouse gas emissions in 2007 alone—equivalent to the annual emissions from 27 million vehicles—and saved about \$16 billion on their energy bills. Savings are on track to nearly double in 10 years as more households, businesses, and organizations rely on ENERGY STAR for guidance in investing in energy-efficient products and practices. Additional information on program benefits can be found in the ENERGY STAR Overview of 2007 Achievements available at energystar.gov/publications.

New elements addressed in this report include:

- Expanded discussion on how EPA verifies energy performance through its Compliance Audit Program, which includes EPA verification testing, third-party testing, and quality assurance testing for lighting products (Section III).
- Expanded discussion of the criteria that EPA and DOE use to ensure consistency when selecting products that can earn the ENERGY STAR (Section V).

Section I. Overview of ENERGY STAR program and trademarks

To fully appreciate the value of ENERGY STAR, it is essential to understand the statutory basis and history of the ENERGY STAR program, its registered trademarks and brand evolution, the methods that EPA and DOE use to maintain trademark protection and program integrity, and the scope and nature of current licensing agreements that allow others to use the ENERGY STAR name and logos under certain conditions. EPA established the ENERGY STAR program in 1992 under the authority of the Clean Air Act, Section 103(g), among others. To date, the ENERGY STAR program has active licensing agreements with multiple foreign governments and more than 12,000 private and public sector organizations.

A. Program background

The ENERGY STAR program was established by EPA in 1992, under the authority of the Clean Air Act Section 103(g), which directs the Administrator to “conduct a basic engineering research and technology program to develop, evaluate, and demonstrate non-regulatory strategies and technologies for reducing air pollution.” The section also calls on the Administrator to provide opportunities for industry, public interest groups, scientists, and other interested persons to participate in strategy development. It further directs EPA to include as elements of the program improvements in non-regulatory strategies and technologies for preventing or reducing multiple pollutants including carbon dioxide. The ENERGY STAR program is one component of the Administrator’s response. ENERGY STAR is a voluntary, public-private partnership designed to reduce energy use, greenhouse gas emissions, and related air pollution.

The ENERGY STAR label was first introduced to identify energy-efficient computers but has since grown to distinguish other energy-efficient products across more than 50 categories. Since 1996, EPA has collaborated with DOE based on a Memorandum of Cooperation between the two agencies, which gives DOE responsibility for some product categories, as shown in Table 1. In addition, EPA developed criteria to allow the label to be used on energy-efficient new homes in 1995, energy-efficient commercial buildings in 1999, and energy-efficient industrial plants in 2006. In 2005, Congress enacted the Energy Policy Act. Section 131 of the Act amends Section 324 (42 USC 6294) of the Energy Policy and Conservation Act and requires, among other provisions, that the Administrator of EPA and the Secretary of DOE work jointly 1) to promote ENERGY STAR-compliant technologies as the preferred technologies in the marketplace for achieving energy efficiency and reducing pollution; 2) to enhance public awareness of the ENERGY STAR label; 3) to preserve the integrity of the ENERGY STAR label; 4) to regularly update ENERGY STAR products criteria; and 5) to solicit comments from interested parties prior to establishing or revising an ENERGY STAR product category, specification, or criterion.

B. ENERGY STAR brand and marks

ENERGY STAR is more than a label awarded for energy efficiency. It is a partnership among government, business, and consumers, united in the pursuit of a common goal—to protect our environment for future generations. Since the inception of this program, key principles have been employed to position ENERGY STAR to be broadly appealing to the above partnerships. Key principles of the ENERGY STAR brand and attributes of the products that earn the ENERGY STAR include:

- The products and services protect the environment through superior energy efficiency.
- The products provide a simple way for consumers to find and select energy-saving products and practices.
- The products and services achieve superior energy efficiency without trade-offs in performance or quality.
- The products and services offer energy savings with attractive paybacks if there are higher initial first costs.
- Government backing of ENERGY STAR provides valuable, unbiased information to consumers.

ENERGY STAR is a registered mark of EPA and is protected by federal trademark law as codified in the Lanham Act, 15 USC Chapter 22. EPA first registered ENERGY STAR as a service mark in 1996 and as a certification mark in 1997, followed by additional registrations as new performance specifications were developed to cover expanding program offerings and partnership needs.

While the ENERGY STAR trademark was always protected by common law, a federal registration for the mark served the following purposes:


- Constructive notice to the public of EPA's ownership claim to the mark.
- A legal presumption of EPA's ownership of the mark and exclusive right to use the mark nationwide.
- The ability to file the U.S. registration with the U.S. Customs Service to prevent importation of infringing foreign goods.

In 2002, the program undertook an extensive review and revision of the ENERGY STAR program offerings, logos, and certification marks with the assistance of Interbrand, an international brand consulting firm. Figure 1, an excerpt from the ENERGY STAR program identity guidelines, *Using the ENERGY STAR Identity to Maintain and Build Value*, shows the marks that are currently in use and their proper applications. The transition to this new set of marks was staged over a 4-year period and was completed with the renewal of the EPA ENERGY STAR agreement with the European Union in 2006.


Figure 1. Excerpt from Using the ENERGY STAR Identity to Maintain and Build Value

THE ENERGY STAR MARKS	
Promotional Mark	Use the Promotional Mark on any materials that feature ENERGY STAR such as brochures, media kits and flyers. It is to be used in public education campaigns on the benefits of ENERGY STAR.
Certification Mark	Use the Certification Mark as a label on products, homes, and buildings that meet or exceed ENERGY STAR performance guidelines. See special applications: <ul style="list-style-type: none"> • Insulation (pages 9.2-9.3); • HVAC (pages 6.6-6.7).
Linkage Phrase Mark	Use the Linkage Phrase Mark in marketing materials, such as ads and circulars, to show that a company sells either ENERGY STAR qualified products or services that can deliver ENERGY STAR performance levels.
Partnership Marks	Use the Partnership Mark to promote an organization's commitment to and partnership in the ENERGY STAR Program.


Preferred




Optional






Preferred




Preferred




Optional

Preferred



Optional



In addition, EPA protects against the unauthorized use of the term “ENERGY STAR” as part of a domain name and considers such use to be an infringement of trademark rights under the Lanham Act, including the Anti-Cybersquatting Protection Act (ACPA), at 15 USC 1125(d). Furthermore, the term “ENERGY STAR” as part of a domain name is protected from unauthorized use by the Uniform Dispute Resolution Policy that is incorporated into each domain name’s registration agreement.

In June 2007, Interbrand released a report on the ENERGY STAR brand which focused on the art and science of branding, the core principles of the ENERGY STAR brand, the evolution of the ENERGY STAR brand, future opportunities and challenges for the brand, and ways to ensure future success of the brand. According to this report, “ENERGY STAR has grown into a well-recognized consumer brand, the result of well-crafted strategies, market-defined insights, and a perseverance to always improve on the past.” In addition, the report noted that, “. . . EPA has put the brand management tools and standards in place to manage the brand for continued success.”

C. *Maintaining trademark protection and program integrity*

In order to maintain the full protection of trademark and other applicable laws, EPA and DOE ensure quality control over the products and services on which the marks are used and the meeting of performance specifications for certification. EPA and DOE work to monitor and stop unauthorized or confusing use of the marks. The following are ways in which EPA and DOE establish and maintain control over the use of the mark:

- By entering into Partnership Agreements with product manufacturers, retailers, energy efficiency program administrators, builders, and others, which specifically outline the terms and conditions for using the ENERGY STAR name and marks
- By issuing ENERGY STAR program identity guidelines to program partners and third parties to ensure proper use of the logo (ENERGY STAR logo use and identity guidelines can be downloaded directly from the following URL:
www.energystar.gov/ia/partners/logos/downloads/BrandBook508r.pdf)
- By monitoring the use of the name and marks in trade media, advertisements, the Internet, and stores
- By responding when consumers, competitors, program partners, and others bring possible trademark infringements to the attention of EPA or DOE
- By auditing compliance through product testing
- By requiring product manufacturers to report qualification test results, which are reviewed and approved or disapproved
- By assessing consumer experience with and perceptions of ENERGY STAR when purchasing or shopping for qualified products and services
- By updating performance specifications as needed (e.g., when high levels of market penetration are reached; underlying reference standards are revised; or there are substantial changes in technology, features, and functionality, etc.) to ensure that the ENERGY STAR designation remains meaningful in the marketplace

Additionally, professional services monitor the filing or publication of applications at the U.S. Patent and Trade Office and provide oversight and legal protection for some ENERGY STAR qualified products that are covered by National Appliance Energy Conservation Act (NAECA) and the Federal Trade Commission (FTC) Energy Guide Labeling requirements.

In general, once a possible infringement of EPA's trademark is identified (an improper use or an unauthorized use), EPA or DOE sends a letter notifying the company of its potential infringement on the ENERGY STAR mark. The letter identifies EPA's rights to the mark, provides any documentation to evidence those rights, and informs the company that EPA views the company's use as an infringement of EPA's mark. The initial letter sent, especially to a program partner, typically has the tone of a "friendly reminder." However, if the potential infringer does not comply with the request, EPA sends a "cease-and-desist" letter containing a more stern warning that the company's use is considered an infringement of EPA's rights and steps will be taken to prevent further unauthorized use of the mark. EPA's Office of General Counsel (OGC) works with the program on such letters. Additional details about procedures undertaken to address improper or unauthorized use of the ENERGY STAR name and mark for specific infringements are provided in Section III C.

D. Current licensing agreements governing the use of ENERGY STAR

Since the program’s inception in 1992, collaboration and partnership have been key program design strategies and cornerstones of success. Partners help promote energy-efficient products and homes by labeling qualified models with the ENERGY STAR and/or educating consumers about their benefits. ENERGY STAR solutions have been developed to work within existing market channels in key sectors. These solutions are based on years of experience in understanding market complexities, identifying barriers to energy efficiency, and developing strategies to overcome these barriers. To ensure that the ENERGY STAR name and logo are properly used by all market actors, EPA has currently licensed the use of the ENERGY STAR logo to DOE, multiple foreign governments, and more than 12,000 private and public sector organizations, as summarized below.

DOE Memorandum of Cooperation

In 1996, EPA and DOE entered into a Memorandum of Cooperation (MOC) to accelerate market acceptance of highly efficient building technologies through voluntary public/private partnerships. Through this agreement, EPA allows DOE to use the ENERGY STAR name and logo to promote certain energy-efficient appliances and windows. In the agreement, EPA retains ownership of the ENERGY STAR name and logo, with both agencies agreeing to oversee and ensure “proper use of the ENERGY STAR logo by its partners, consistent with the requirements of 15 USC Chapter 22, various state laws on trademarks, and this MOC.” Table 1 below and on the following pages shows the agency lead for each product.

Table 1. Federal Management of ENERGY STAR Qualified Products by Category¹

Product Category	EPA Managed Products	DOE Managed Products
Appliances	Dehumidifiers Room air cleaners	Clothes washers* Dishwashers* Refrigerators and freezers* Room air conditioners*
Heating and Cooling	Boilers* Ceiling fans Central air conditioners and air source heat pumps* Furnaces* Geothermal heat pumps* Light commercial heating, ventilation, and air conditioning (HVAC)* Programmable thermostats Ventilating fans	
Home Electronics	Battery charging systems Cordless phones Combination units Digital to Analog (DTA) Converters	

¹ Throughout the report, products are assigned to only one product category to avoid duplicative information.

Product Category	EPA Managed Products	DOE Managed Products
	DVD products External power adapters Home audio Televisions VCRs	
Home Envelope	Insulation and air sealing (home sealing) Roof products	Windows, doors, and skylights**
Lighting	Decorative Light Strings Exit signs* (suspended 5/08) RLFs Traffic signals* (suspended 5/07)	CFLs***
Office Equipment	Computers Copiers Digital Duplicators Fax machines Mailing machines Monitors Multi-function devices Printers Scanners	
Commercial Food Service	Commercial dishwashers Commercial fryers Commercial hot food holding cabinets Commercial ice machines Commercial solid door refrigerators and freezers Commercial steam cookers	
Other	Transformers* (suspended 5/07) Vending machines Water coolers	

*Indicates products where federal standards are also in effect.

**The International Energy Conservation Code (IECC) has been adopted by most jurisdictions within the United States and prescribes energy performance standards for windows, doors, and skylights.

*** CFL federal standard was established through the Energy Policy Act of 2005 (EPAct 2005).

International agreements with EPA governing use of ENERGY STAR

EPA has entered into a number of agreements with foreign governments allowing them to use the ENERGY STAR name and logo to designate energy-efficient products and educate consumers about energy-efficient options in their respective countries. Table 2 on the following page provides information about these agreements, including products covered.

Partnership Agreement requirements by partner and category

As of 2007, more than 12,000 organizations are ENERGY STAR partners, committed to improving and promoting energy efficiency for products, homes, and businesses. These partners include 2,000 manufacturers; 1,000 retailers; 5,000 building partners; 550 utilities, states, and other energy efficiency program administrators; and hundreds of energy service providers and financial lenders. Major requirements by Partnership Agreement are shown in Table 3.

Each partner is also encouraged to undertake additional voluntary activities to receive special distinction. Additional voluntary activities generally fall into one of the following categories:

- **Equipment and building improvements** such as considering energy efficiency improvements in company facilities, pursuing the ENERGY STAR label for buildings, purchasing ENERGY STAR qualified products or revising company purchasing or procurement specifications to include ENERGY STAR, and ensuring the power management feature is enabled on all ENERGY STAR qualified monitors and computers in company facilities.
- **Employee awareness improvements** such as educating employees about ENERGY STAR and featuring information about ENERGY STAR on partner Web sites and in other promotional materials.
- **Provision of written updates to EPA and DOE** on efforts undertaken to increase availability of ENERGY STAR qualified products and/or to promote awareness of ENERGY STAR and its message.

Table 2. International Agreements by Country

Country	Type of Agreement	Foreign Signature	Date Signed	Products Covered
Australia	Exchange of letters	Sustainable Energy Development Authority (SEDA)	November 14, 1996; Expansion letter April 7, 1999	Computers, monitors, printers, fax machines, copiers, televisions and VCRs
	Exchange of letters	Australian Greenhouse Office	May 7, 2001; expansion letter from EPA September 6, 2002	Computers, monitors, printers, fax machines, copiers, televisions, VCRs, telephony, set-top boxes, HVAC equipment, RLFs, exit signs, traffic signals, dehumidifiers, water coolers, commercial solid door refrigerators and freezers, roof products, transformers. The letter left open the opportunity for further expansion to subcategories of products found only in the Australian market, assuming resultant specification levels conform to ENERGY STAR principles.
New Zealand	Letter of Intent (voluntary, non-binding)	New Zealand Energy Efficiency and Conservation Authority (EECA)	February/March 1997	Computers, monitors, printers, fax machines, copiers
	Exchange of letters to expand agreement	EECA	May 2004	Televisions, VCRs, DVDs, home audio, set-top boxes, central air conditioners, air source heat pumps, programmable thermostats, RLFs, home sealing and insulation products
European Union	Agreement (formal)	Commission of European Communities	December 19, 2000 Renewed September 2006	Computers, monitors, printers, fax machines, copiers, scanners, multi-function devices
Japan	Letter of Intent (voluntary, non-binding)	Ministry of International Trade and Industry (MITI), Agency of Natural Resources and Energy	July 18, 1995 (by EPA) September 14, 1995 (by MITI); expansion letter February 9, 1999	Computers, monitors, printers, fax machines, copiers; expanded to include scanners and multi-function devices
Taiwan	Exchange of letters	Taipei Economic and Cultural Representative in the United States (TECRO)	July 8, 1999	Computers, monitors, printers, fax machines, copiers, scanners, multi-function devices

Country	Type of Agreement	Foreign Signature	Date Signed	Products Covered
Canada	Exchange of letters	Natural Resources Canada (NRCan)	May 2, 2001 by EPA/DOE; May 29, 2001 by NRCan	Computers, monitors, printers, fax machines, copiers, scanners, multi-function devices, televisions, VCRs, exit signs (suspended), central air conditioners, air source heat pumps, dehumidifiers, programmable thermostats, water coolers, dishwashers, clothes washers, refrigerator/freezers, room air conditioners, CFLs
	Exchange of letters to expand agreement		May 2003	Ground source heat pumps, ventilating fans, ceiling fans, traffic signals (suspended), CFLs, cordless phones, set-top boxes, transformers, and commercial solid door refrigerators and freezers
	Exchange of letters to expand agreement		December 2004	New homes
	Exchange of letters to amend agreement		March 2008	Light commercial HVAC, commercial cooking products, air cleaners, oil furnaces, external power adaptors, digital TV adaptors, RLFs, decorative light strings. Products removed: exit signs, distribution transformers.
European Free Trade Association (EFTA)–Norway, Iceland and Lichtenstein	Exchange of letters	Norway Ministry of Petroleum and Energy; Iceland Ministry of Industry; Lichtenstein Office of Economic Affairs	August 31, 2004	Computers, monitors, printers, fax machines, copiers, scanners, multi-function devices

Table 3. Partnership Agreement Requirements by Partner and Category

Product category		Comply with current eligibility criteria	Comply with current identity guidelines	Provide at least one product (within one year unless otherwise noted)	Label product	Label product packaging or insert	Provide qualified product list (annually unless otherwise noted)	Provide unit shipment or sales data or equivalent (annually unless otherwise noted)	Special Requirements
MANUFACTURERS									
Appliances	Clothes washers	X	X	X	X	X	X		
	Dehumidifiers	X	X	X	X	X	X	X	
	Dishwashers	X	X	X	X	X	X		
	Refrigerators and freezers	X	X	X	X	X	X		
	Room air conditioners	X	X	X	X	X	X		
	Room air cleaners	X	X	X	X	X	X	X	Agree not to use quotes or statements related to indoor air quality that misrepresent the views of the EPA Indoor Environments Division in public documents
Heating & Cooling	Boilers	X	X	X		X	X	X	
	Ceiling fans	X	X	X		X	X	X	
	Central air conditioners and air source heat pumps	X	X	X		X	X	X	Offer training to distributors and/or contractors

Product category		Comply with current eligibility criteria	Comply with current identity guidelines	Provide at least one product (within one year unless otherwise noted)	Label product	Label product packaging or insert	Provide qualified product list (annually unless otherwise noted)	Provide unit shipment or sales data or equivalent (annually unless otherwise noted)	Special Requirements
	Furnaces	X	X	X		X	X	X	Offer and encourage training to distributors and/or contractors
	Geothermal heat pumps	X	X	X		X	X	X	
	Light commercial HVAC	X	X	X		X	X	X	Offer and encourage training to distributors and/or contractors
	Programmable thermostats	X	X	X	X	X	X	X	Participate in new consumer education campaign
	Ventilating fans	X	X	X	X	X	X	X	
Home Electronics	Battery charging systems	X	X	3 months		X	Semi-annually	X	
	Cordless phones	X	X	X	X	X	X	X	
	Combination units	X	X	2 years	X	X	X	X	
	Digital to Analog (DTA) converters	X	X	X	X	X	X	X	
	DVD products	X	X	2 years	X	X	X	X	
	External power adapters	X	X	3 months		X	Quarterly	X	Never label the product on the unit itself
	Home audio	X	X	2 years	X	X	X	X	

Product category		Comply with current eligibility criteria	Comply with current identity guidelines	Provide at least one product (within one year unless otherwise noted)	Label product	Label product packaging or insert	Provide qualified product list (annually unless otherwise noted)	Provide unit shipment or sales data or equivalent (annually unless otherwise noted)	Special Requirements
	Televisions	X	X	6 months (Nov 08)	X	X	X	X	
	VCRs	X	X	2 years	X	X	X	X	
Home Envelope	Insulation products	X	Special Application	Before partnership is activated	X	X			
	Roof products	X	X	X		X	X	X	Include special text in product literature and provide EPA with test data to certify the product has met the required performance characteristics
	Windows, doors, and skylights	X	X	Before partnership is activated	X	X			Provide a QPI form with DOE signature to be listed as an ENERGY STAR partner
Lighting	Compact fluorescent lamps	X	X	X		X	Quarterly	Bi-annually	Provide accredited lab test data to DOE for specific model and product packaging samples
	Decorative light strings	X	X	X		X	X	X	Provide ENERGY STAR training to all sales staff and provide EPA with test data for all models/families

Product category		Comply with current eligibility criteria	Comply with current identity guidelines	Provide at least one product (within one year unless otherwise noted)	Label product	Label product packaging or insert	Provide qualified product list (annually unless otherwise noted)	Provide unit shipment or sales data or equivalent (annually unless otherwise noted)	Special Requirements
	Exit signs	Suspended May 1, 2008							
	RLFs	X	X	X		X	X	X	Provide ENERGY STAR training to all sales staff and provide EPA with test data for all models/ families
	Traffic signals	Suspended May 1, 2007							
	Office Equipment								Provide special text inside user manual
	Computers	X	X	X	X	X	X	X	
	Copiers	X	X	6 months	X	X	X	X	
	Digital Duplicators	X	X	6 months	X	X	X	X	
	Fax Machines	X	X	6 months	X	X	X	X	
	Mailing Machines	X	X	6 months	X	X	X	X	
	Monitors	X	X	X	X	X	X	X	
	Multi-function devices	X	X	6 months	X	X	X	X	
	Printers	X	X	6 months	X	X	X	X	
	Scanners	X	X	6 months	X	X	X	X	
Commercial Food Service	Commercial dishwashers	X	X	X	X	X	X	X	
	Commercial fryers	X	X	X	X	X	X	X	
	Commercial hot food holding cabinets	X	X	X	X	X	X	X	

Product category		Comply with current eligibility criteria	Comply with current identity guidelines	Provide at least one product (within one year unless otherwise noted)	Label product	Label product packaging or insert	Provide qualified product list (annually unless otherwise noted)	Provide unit shipment or sales data or equivalent (annually unless otherwise noted)	Special Requirements
	Commercial ice makers	X	X	X	X	X	X	X	
	Commercial solid door refrigerators and freezers	X	X	X	X	X	X	X	
	Commercial steam cookers	X	X	X	X	X	X	X	
Other	Transformers	Suspended May 1, 2007							
	Vending machines	X	X	X	X	X	X	X	
	Water coolers	X	X	X	X	X	X	X	
Retailers			X			Check on a regular basis	Quarterly (for retailers of clothes washers, dehumidifiers, dishwashers, room AC, and refrigerators)		Submit a program plan within 2 months; submit marketing materials to review for accuracy; promote ENERGY STAR in partner materials and on partner Web site
Energy Efficiency Program Sponsors			X						Submit a program plan

	Comply with current eligibility criteria	Comply with current identity guidelines	Qualify or evaluate at least 1 home in 12 months	Label home	Submit marketing materials to EPA for review	Provide market indicators	Special Requirements
HOME PERFORMANCE							
<i>Energy Efficiency Program Sponsors</i>	X	X	After 2 years, must evaluate 50 homes per year		X	Quarterly	Submit program plan
HOME IMPROVEMENT							
<i>Home Sealing (Recommended D-I-Y or contractor process)</i>	X	Special Application			X	Retailers that promote home sealing provide indicators; in-store sampling; and support contractors provide additional information.	
HOMES							
	Comply with current eligibility criteria	Comply with current identity guidelines	Qualify or evaluate at least 1 home in 12 months	Label home	Submit marketing materials to EPA for review	Provide market indicators	Special Requirements
<i>Builders</i>	X	X	X	X			
<i>Lenders</i>	X	X	3 mortgages per year				
<i>Efficiency Program Sponsors</i>	X	X					Submit program plan within 3 months
<i>Home Energy Raters and Providers</i>	X	X	X	X		X (homes qualified)	

For details on special applications, refer to the ENERGY STAR program identity guidelines, *Using the ENERGY STAR Identity to Maintain and Build Value*.

Section II. Monitoring and ensuring appropriate use of ENERGY STAR

To ensure that the ENERGY STAR name and logos are used appropriately in the marketplace, EPA and DOE undertake the following activities:

- Monitoring the use of the ENERGY STAR name and marks in trade media, advertisements, and on Web sites, and responding when consumers, competitors, program partners, and others bring possible trademark infringements to the attention of EPA or DOE
- Assessing in-store use of the ENERGY STAR name and marks on products, packaging, and signage at retail locations

EPA and DOE maintain formal protocols for dealing with potential trademark infringements and label misuse, which are actively pursued until issues are resolved. As shown in Table 4, trademark violations as a percent of total companies advertising in print is negligible—estimated at less than 1 percent of advertisers in 2007 (0.66 percent)—and misuse as a percent of total advertising volume is also low—estimated at less than 2 percent of advertising volume in 2007 (1.35 percent). EPA and DOE also receive quarterly reports from an Internet monitoring service that identifies company Web sites with potential violations. Of the 824 sites with potential violations identified in 2007, less than 5 percent were estimated to contain trademark violations.

Direct input provided to EPA and DOE program staff is another channel for identifying potential infringements. In September 2007, EPA added a “logo misuse” e-mail address to its Web site to further track inappropriate uses of the ENERGY STAR logo from outside sources. Retail store level assessments have also been an effective tool for monitoring logo use, improving qualified product lists, and taking corrective action as needed. EPA also investigates complaints about ENERGY STAR qualified products reported to the ENERGY STAR Hotline.

A. Monitoring use and responding to possible misuse of ENERGY STAR in advertisements and on the Internet

EPA undertakes the following activities to track the use of the ENERGY STAR name and logo and to help maintain the value of the ENERGY STAR program:

- Monitoring print advertisements monthly
- Tracking Internet and domain name use quarterly
- Responding to potential trademark infringements raised by consumers and third parties
- Monitoring daily media

If EPA or DOE identifies activities that are inconsistent with the ENERGY STAR program identity guidelines and/or that may be perceived as misleading to consumers, the appropriate program manager takes action to resolve the situation. The type of action depends on the nature of the instance and the type of organization involved. Examples of actions taken may include the following:

- **Contacting companies that misuse the logo or program name.** Regardless of how the violation is reported, EPA and/or DOE contact those companies with confirmed name or logo

misuses by letter, e-mail, or phone depending on the nature of the violation and the history of prior contacts with the company. All correspondence with the company is tracked in an internal database allowing the program to monitor recurring violations as well as their resolution.

- **Terminating partnership and/or taking legal action.** If a company refuses to comply after several attempts to resolve a situation and EPA's Office of General Counsel has reviewed the matter, EPA or DOE can notify a company that its partnership has been terminated. As most companies are cooperative, this level of action is extremely rare.

Monitoring print advertisements monthly

EPA works with a national print monitoring service to monitor more than 18,000 newspapers, magazines, and trade journals for use of the ENERGY STAR marks. All advertisements received are reviewed for consistency with the ENERGY STAR program identity guidelines, *Using the ENERGY STAR Identity to Maintain and Build Value*. Advertisements using the marks in a manner inconsistent with the identity guidelines (e.g., use of the partner mark by a non-partner or use of the certification mark with a product or service that has not earned the ENERGY STAR) are individually reviewed and reported to the appropriate EPA and DOE program managers for follow-up action. This action typically involves calling the organization that placed the advertisement and following up with a letter formally informing the advertiser of EPA and DOE concerns and the requested change. EPA continues to monitor print advertisements in subsequent months to ensure corrective action by the advertiser. EPA and DOE program managers also individually review and address minor alterations or outdated applications of the ENERGY STAR mark.

As shown in Table 4, trademark violations as a percent of total companies advertising in print is negligible—estimated at less than 1 percent of advertisers in 2007 (0.66 percent)—and misuse as a percent of total advertising volume is also low—estimated at less than 2 percent of advertising volume in 2007 (1.35 percent).

The most frequently occurring type of trademark violation in print advertisements is the following:

- Unauthorized use of an ENERGY STAR mark (e.g., use of the ENERGY STAR partner mark by a non-partner)

Other trademark violations that occur include the following:

- Use of the logo with a product or service that is not ENERGY STAR qualified
- Endorsement use (e.g., implying that EPA, DOE, or the ENERGY STAR program endorses the product or service advertised)
- Use of logo in name (e.g., ENERGY STAR in company, product, or service name)

In addition to the trademark violations, the most frequently occurring logo misapplication in print advertisements is the following:

- Use of an outdated form of the ENERGY STAR mark

Other misapplications that occur include the following:

- Use of ENERGY STAR mark without direct association with a qualified product
- Alteration of the ENERGY STAR mark

Monitoring Internet and domain name use quarterly

Consumers increasingly use the Internet as a source of information when researching products and services. As such, EPA has a responsibility to ensure that ENERGY STAR information on the Internet remains accurate and credible. EPA identifies and addresses information on the Internet involving 1) false statements about the qualified status of a product or service, and/or 2) the use of the ENERGY STAR name or logo to imply EPA or DOE endorsement of a product or service. To do so, each quarter EPA works with a leading Internet monitoring service to search the Internet for ENERGY STAR logo use and domain names that include ENERGY STAR. As part of this process, the monitoring service provides a list of Web sites that appear to be misusing the logo or have ENERGY STAR in their domain name. (EPA has granted permission to some public entities and state energy efficiency program administrators to use ENERGY STAR as part of their program or domain name with signed agreements to this effect.)

Web sites that are potentially using the logo or the ENERGY STAR name in a manner inconsistent with the ENERGY STAR program identity guidelines are individually reviewed. When instances of inconsistencies are confirmed, the Web site is referred to the appropriate program managers for follow-up action. EPA also reviews the Web sites of major product retailers to gauge the quality and use of ENERGY STAR information on their Web sites.

As shown in Table 4, quarterly reports from an Internet monitoring service identified 824 company Web sites with potential violations in 2007. After a closer review of these 824 sites, less than 5 percent were found to contain trademark violations and all of these were addressed.

In addition, direct input provided to EPA and DOE program staff and the public is another channel for identifying potential infringements. In 2007, EPA and DOE received approximately 60 reports of logo misuse compared to 30 reports in 2006. Of these reported instances, 45 were found to be violations in 2007 and 16 were found to be violations in 2006.²

Responding to potential trademark infringements and other complaints raised by consumers and third parties

The success of ENERGY STAR depends heavily on high quality performance and customer satisfaction with ENERGY STAR qualified products and services. To maintain customer satisfaction, EPA and DOE must respond to customer, partner, and stakeholder concerns in a timely manner. The program's toll-free hotline is one channel for receiving this type of feedback. Direct input provided to EPA and DOE program staff is another channel. In 2007, EPA and DOE received approximately 60 e-mails regarding logo misuse. By responding to inquiries from consumers, competitors, and other interested stakeholders, EPA and DOE ensure that the program name and logo are used fairly and consistently in the marketplace. The protocol for responding to consumer and third party inquiries involves referring the incident to the appropriate EPA or DOE program managers, contacting the company about the potential infringement and taking appropriate follow-up action, and notifying the third party about the actions taken and resolution of the concern. In the case of a mislabeled product, EPA and DOE follow an established response protocol as described in Section III C.

EPA also thoroughly investigates each complaint about qualified products and services received through the ENERGY STAR Hotline. In 2007, 114 complaints were received, about half concerned CFLs. In the case of CFLs, complaints were typically for early failure or some type of defect (humming

² EPA Office of Air and Radiation, Climate Protection Partnerships Division.

or slow start time). The response to these CFL complaints is to request additional information about the type of light fixture used, the circumstances, and the model and brand information. Many of the complaints are the result of using a regular CFL in a fixture with special features, such as a dimmer. This information, obtained through the hotline, helps to inform marketing efforts, such as creating specific frequently asked questions for the use of CFLs.

Table 4. Logo Violations and Other Misapplications of the ENERGY STAR Mark 2006 – 2007

	2006		2007	
Print Advertisement Results by Number of Companies	Companies	%	Companies	%
Proper Use	8,739	91.32%	8,865	93.67%
Total Misapplication	792	8.28%	537	5.67%
Minor Alteration	187	1.95%	113	1.19%
Use of Outdated mark	575	6.01%	418	4.42%
Use without Direct Association	30	0.31%	6	0.06%
Total Violations	39	0.41%	62	0.66%
Use of Logo in Name	0	0.00%	0	0.00%
Unauthorized Use	31	0.32%	51	0.54%
Endorsement Use	0	0.00%	0	0.00%
Use with a Product or Service that is not qualified	8	0.08%	11	0.12%
Total companies advertising	9,570		9,464	
Print Advertisement Results by Clip Volume	Clips	%	Clips	%
Clips with misapplications or violations	3,221	2.40%	1,637	1.35%
Total number of advertisements monitored	133,948		121,260	
Results from Quarterly Internet Monitoring	Companies	%	Companies	%
Proper Use	654	63.87%	624	71.40%
Total Misapplication	343	33.50%	213	24.37%
Total Violations	27	2.64%	37	4.23%
Total Companies Monitored for Potential Violations Online	1,024		874	
Results from Logo Misuse Email, Program Staff, and Store Assessments	Companies		Companies	
Violations Received from Logo Misuse Email and Program Staff	16		45	

Source: EPA Office of Air and Radiation, Climate Protection Partnerships Division. Note since 2002, based on the large volume and costs associated with data collection and assessment, EPA reduced collection of print advertising clips to 8 of the 12 months; therefore the values of print advertisement results in Table 4 for 2006 and 2007 are based on 8 months of data.

Monitoring daily media

To understand and manage how ENERGY STAR qualified products and services are portrayed by the media to the general public, EPA monitors print articles and analyzes messaging trends over time. Due to the wide range of market actors independently disseminating information about ENERGY STAR, this process is critical, as it helps EPA and DOE ensure that program messaging remains consistent, accurate, and credible regardless of its source. To this end, during the first three quarters of 2007 more than 18,000 newspapers, magazines, and trade journals were monitored for articles that mentioned ENERGY STAR each month through a national media monitoring service. Beginning in October 2007, EPA switched to a national online media monitoring service, and the process was revised to incorporate limited online and broadcast media monitoring. On a daily basis print, online, and broadcast placements are posted to a Web-based portal for review. For selected months, EPA conducts a detailed messaging analysis and assesses trends across article content and distribution. Any instances of inaccurate or potentially misleading information are reported to the appropriate program managers for follow-up action as needed.

B. Assessing in-store use of ENERGY STAR

To maintain the value of the ENERGY STAR program, EPA and DOE need to ensure that qualified products are presented properly in the retail channel. To do so, EPA conducts semi-annual quality assurance reviews, referred to as retail store level assessments, at select retailers in 10 geographically diverse metropolitan areas. Since 2001, EPA has conducted 11 rounds of quality assurance reviews, in 12 unique stores, covering 16 products: appliances (dishwashers, clothes washers, refrigerators, room air conditioners, room air cleaners, and dehumidifiers), home electronics (TVs and DVD players), CFLs, residential lighting fixtures (exterior fixtures, interior fixtures, table/floor lamps, ceiling fans, and ceiling fan lighting kits), programmable thermostats, and insulation. Each assessment focuses primarily on seasonal products with the selected retailers varying each round. The quality assurance reviews examine three distinct in-store efforts:

- ENERGY STAR qualified products on store shelves
- The presence and quality of display materials that showcase the ENERGY STAR name and/or logo
- Sales staff knowledge and use of ENERGY STAR information in assisting customers

Table 5, below, shows the products that have been assessed over 11 rounds of store-level assessments.

Table 5. Products Covered by Retail Store Level Assessment

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8	Round 9	Round 10	Round 11	Total Assessments	
	Fall '01 (Nov)	Spring '02 (June)	Spring '03 (April)	Fall '03 (Oct/Nov)	Fall '04 (Oct/Nov)	Summer '05 (Jul/Aug)	Fall '05 (Oct/Nov)	Spring '06 (June)	Fall '06 (Oct/Nov)	Spring '07 (May/June)	Fall '07 (Oct/Nov)		
Products	Ceiling fans	No	Yes*	Yes	No	No	Yes	No	Yes	No	Yes	No	5
	Compact fluorescent lamps	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	10
	Residential lighting fixtures**	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	10
	DVD products	No	Yes	Yes***	Yes	Yes	No	Yes (PSI only)	No	No	No	No	5
	Televisions	Yes	No	Yes	Yes	Yes	No	Yes (PSI only)	No	No	SSE/DCI	Yes	7
	Clothes washers	Yes	No	Yes	No	Yes	Yes	Yes	No	No	No	Yes	6
	Dehumidifiers	No	No	Yes	No	No	Yes	No	Yes	No	Yes	No	4
	Dishwashers	Yes	No	No	Yes	Yes	Yes (No SSE)	No	No	No	Yes	No	5
	Room air conditioners	No	No	No	No	No	Yes	No	Yes	No	No	No	2
	Refrigerators	Yes	No	No	Yes	No	Yes (No SSE)	Yes (8 markets)	No	Yes	No	No	5
	Room air cleaners						Yes (No SSE)	No	Yes (PSI only)	No	Yes	No	3
	Programmable thermostats	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	7
Insulation	No	No	No	No	Yes	No	Yes	No	Yes	No	DCI	4	

SSE = Sales Staff Evaluation
 PSI = Product Shelf Inventory

*For products, "Yes" indicates that sales staff evaluation (SSE), display check inventory (DCI), and product shelf inventory (PSI) were performed for the given product (unless otherwise noted).

**Includes interior/exterior fixtures, and table/floor lamps.

***In Rounds 3 and 4, DVDs and TVs were assessed together for the SSE. In Rounds 1 and 2, they were assessed separately.

Product shelf and display check inventory are two key components for properly assessing the retail channel. Sales staff evaluation, also a key component to these assessments, will be discussed further in Section IV, as it pertains more directly to evaluating the consumer experience with ENERGY STAR. During assessments, if products are found labeled with the ENERGY STAR but are not on the Qualified Product List, EPA follows an established response protocol discussed in Section III C, Product mislabeling protocol.

- **Product shelf inventory (PSI).** During the product shelf inventory, field personnel capture the extent to which ENERGY STAR qualified products are stocked and examine how accurately the ENERGY STAR logo is being used. Field personnel examine the brand, manufacturer, and model number, as well as the type and location of the logo. This information is used to determine whether products are labeled and/or mislabeled as ENERGY STAR and increase the accuracy of the lists of qualified products on the ENERGY STAR Web site. Improperly labeled products are referred to the appropriate program managers for follow-up action. In 2007, more than 44,000 products were reviewed and 29 violations were found.
- **Display check inventory (DCI).** The display check inventory involves assessing the presence and quality of display materials that showcase the ENERGY STAR name and/or logo. Photographic documentation of materials is gathered if the store has granted permission for photography. Since 2001, field personnel have observed and taken pictures of more than 2,500 pieces of ENERGY STAR focused collateral and display/signage featuring an ENERGY STAR mark. These pieces are compared for consistency with brand messaging and the ENERGY STAR identity guidelines, *Using the ENERGY STAR Identity to Maintain and Build Value*. Any potential misuse of the logo is referred to the appropriate program managers for follow-up action.

Section III. Verifying energy performance of ENERGY STAR products and homes

The energy performance of products, homes, and buildings that meet ENERGY STAR qualifications are certified in accordance with the specifications and procedures outlined in respective Partnership Agreements. Procedures for ensuring that Home Performance programs meet ENERGY STAR quality assurance requirements are similarly outlined in the Home Performance with ENERGY STAR Sponsor Guide. Mislabeling a product, home, building, or service as ENERGY STAR is a violation of trademark law (15 USC Chapter 22), as discussed previously.

EPA and DOE ensure that products meet ENERGY STAR specifications through the following activities:

- Providing clear performance requirements
- Requiring manufacturers to report test results in order to qualify for the ENERGY STAR
- Auditing compliance
 - EPA verification testing
 - Third-party certification testing
 - Quality assurance testing for lighting products
- Providing clear protocol for mislabeling of products
- Requiring home builders to have homes inspected and verified by a qualified home energy rater

A. Qualification testing for products

Qualification testing requirements for products

For products currently labeled as ENERGY STAR, manufacturers are required to report qualification test results to EPA or DOE, which are reviewed and approved or disapproved. Table 6 shows current testing requirements for ENERGY STAR qualified products as of January 1, 2008.

Table 6. ENERGY STAR Product Qualification Testing Requirements

Product Category		Test Procedure	Test Results Reported
Appliances	Clothes washers	DOE test procedure defined in 10 CFR 430, Subpart B, Appendix J1	Minimum Modified Energy Factor, Water Factor (gallons/cycle/ft ³)
	Dehumidifiers	ANSI/AHAM standard DH-1, clauses 4, 5, and 7 with watt-hour meter	Liters/kWh
	Dishwashers	DOE test procedure defined in 10 CFR 430, Subpart B, Appendix C	Energy Factor (cycles/kWh)
	Refrigerators and freezers	DOE test procedure defined in 10 CFR 430, Subpart B, Appendices A1 and B1	Product Class, Adjusted Volume (ft ³), Energy Use (kWh/year)
	Room air conditioners	DOE test procedure defined in 10 CFR 430, Subpart B, Appendix F	Product Class, Energy Efficiency Ratio (EER), Capacity in Btu
	Room air cleaners	ANSI/AHAM AC-1	Clean Air Delivery Rate (CADR), Standby Power (if applicable, W), Ozone production (if applicable, reported in ppb in accordance with the UL Standard 867)
Heating and Cooling	Boilers	DOE test procedure defined in 10 CFR 430; ANSI/ASHRAE standard 124-1991	Annual Fuel Utilization Efficiency (AFUE), or Combined Appliance Annual Fuel Utilization Efficiency (CAafue)
	Ceiling fans	ENERGY STAR specific testing procedure Laboratories that meet the guidelines provided in EPA's ENERGY STAR Testing Facility Guidance Manual and have been approved to test for ENERGY STAR qualification For requirements specific to light kits: refer to Third Party/Certified Lab Requirement for residential lighting fixtures (RLFs)	Airflow (CFM), Efficacy (CFM/W), Fan Power Consumption (W) For information specific to light kits: refer to Test Results Reported for RLFs
	Central air conditioners & air-source heat pumps	ARI 210/240 and ARI 210/240-94 Use of the CEE Directory of ARI Verified Equipment is encouraged	Seasonal Energy Efficiency Ratio (SEER), Heating Seasonal Performance Factor (HSPF), EER
	Furnaces	DOE test procedure defined in 10 CFR 430, Appendix N	AFUE rating
	Geothermal heat pumps	ISO 13256-1	Coefficient of Performance (COP), EER
	Light commercial HVAC	ARI 210/240 and 340/360	COP, EER, HSPF, Integrated Part-Load Value (IPLV), SEER
	Programmable thermostats	ENERGY STAR specific testing procedure	N/A; no measurable test results collected (only general product details)
	Ventilating fans	Test procedures 915, 916, 920 as certified by HVI	Airflow (CFM), Efficacy (CFM/W), Motor Power (W), Sound (sones)
	Home Electronics	Battery charging systems	ENERGY STAR specific test procedure
Cordless phones		ENERGY STAR specific test procedure	Watts in Standby
Combination units		ENERGY STAR specific test procedure	Watts in Standby

Product Category		Test Procedure	Test Results Reported
	Digital to Analog (DTA) Converters	CEA-2022 and Annex A of CEA 2013-A modified as noted in ENERGY STAR specification for DTAs	Watts in Sleep Mode; Watts in On Mode; Auto Power Down Features; and Default Time for Auto Power Down
	DVD products	ENERGY STAR specific test procedure	Watts in Standby
	External power adapters	Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies (Adopted by ENERGY STAR; funded by CEC/PIER)	No-load power consumption (W) and average active efficiency at 115V/60Hz and 230V/50Hz
	Home audio	ENERGY STAR specific test procedure	Watts in Standby
	Televisions	In version 3.0., televisions will make use of IEC 62087 for active power and IEC 62301 for standby.	Watts in Standby
	VCRs	ENERGY STAR specific test procedure	Watts in Standby
Home Envelope	Insulation and air sealing (home sealing)	ASTM standards E779-87 and E1998-99; CGSB standards 149 and 51.71-95; ANSI Z223.1/NFPA 54: Section H; and ASHRAE 62-1999	N/A; EPA does not maintain a qualified products list for this product category
	Roof products	ASTM standards E 903, C 1549, E 1918, and G 7	Initial solar reflectance; Solar reflectance after 3 years
	Windows, doors, and skylights	NFRC test procedures 100 and 200 Products must be rated, certified, and labeled for both U-Factor (Btu/h.ft ² .°F) and Solar Heat Gain Coefficient (SHGC) in accordance with the procedures of the NFRC	N/A; DOE maintains a manufacturer list for this product category rather than a qualified products list
Lighting	Compact fluorescent lamps (CFLs)	ANSI standards C78.901-2001, C78.5 – 1997, and C78.375 – 1997; ANSI/IEEE standard C62.41 – 1991 (01-May-1991); IESNA LM-9 – 1999, LM-40 – 2001, LM-65 – 2001, and LM-66-00 – 2000; CIE Publication No. 13.3 – 1995; UL 1993; ANSI/IEEE C62.41 (01-May-1991), Category A, 7 strikes; FCC 47 CFR including Part 2 (Equipment Authorization) and Part 18 (Technical Standards and Emission Limits) for consumer RF Lighting Equipment limits Qualified Product Information must be completed by a NVLAP-affiliated laboratory	Minimum Efficacy (lm/w), 1,000-hour Lumen Maintenance (% of initial lamp lumens), Color Rendering Index, Correlated Color Temperature (°K), Lumen Maintenance at 40 percent of rated life (% of initial lamp lumens), Power Factor, Run-up Time (sec), Starting Time (ms), Transient Protection, Operating Frequency (kHz), Electromagnetic Interference, Rapid Cycle Stress Test, Interim Life Test, Average Rated Lamp Life (hr), packaging requirements including warranty, language, starting temperature, FTC labeling requirements, incompatibility with controls, CFL/Incandescent Equivalency

Product Category	Test Procedure	Test Results Reported
Decorative Light Strings	ASTM G 154 – 05; CSA-22.2 No.37-M1989 (R2004); CIE 84-1989; CIE 127-1997; IESNA TM-16-05; UL 588-2004	Inspection (number of Lamps per string, replaceable lamps, safety requirements, rated for indoor or indoor/outdoor applications, warranty); Electrical requirements (input power shall not exceed .20 watts, over-voltage); lifetime requirements (maintained light output strings must maintain 50-70%, failed lamps should be no greater than 3%); Weathering requirements (maintained light output, failed lamps); Product packaging for consumer awareness requirements (product suitability, product description, correlated color temperature for white-light strings).
RLFs	ANSI standards C82.2, C82.11, C82.11b, C82.1, C78.5, C81.61, C78.901-2001, and C78.81-2001; IESNA standards LM-9, LM-66, LM-40-01, LM-65-01, LM-9-99, LM-58, and LM-16; IEC standards 60091, 60901, 60061-1, 60081, and 61347-2-3 Amendment 1 to Edition 1 2004-06; CIE 13.3; ANSI/UL 153; UL 1598; UL 1598B; ANSI/UL 935; UL 1993; NFPA 70; FCC 47 CFR Part 18.305 and 18.307; ASTM E283 Third-party certification requirements vary based on eligibility criterion (e.g., in a single submittal a partner might need to seek an independent NVLAP laboratory to test for fixture efficacy, but would be able to self-declare noise performance)	The following are reported unless the partner uses either an “EPA approved Platform Letter of Qualification” or an “EPA-approved documentation from an industry association” (either of these forms takes the place of test documentation):* System Efficacy (lpw), Lamp Life (hr), Lumen Maintenance (% of initial lamp lumens), Lamp Color Rendering Index, Lamp Correlated Color Temperature, Lamp Start Time (ms), Power Factor, Lamp Current Crest Factor, Maximum Measured Ballast Case Temperature During Normal Operation Inside Fixture (°C)**, Ballast Frequency (kHz), Transient Protection, End of Life Protection *Test reports may come from laboratories accredited by NVFtLAP, NVLAP MRA signatories, or ISO 9000 registered facilities (varies by specific eligibility criterion) ** Maximum Measured Ballast Case Temperature During Normal Operation Inside Fixture is always reported for indoor fixtures
Office Equipment	Computers	ENERGY STAR specific test procedure Watts in Idle State, Sleep Mode, and Standby Level
	Copiers, Digital Duplicators	ENERGY STAR specific test procedure Watts in Low Power, Default Time to Low Power (min), Recovery Time from Low Power (sec), Watts in Off, Default Time to Auto-off (min)

Product Category	Test Procedure	Test Results Reported
	Monitors	ENERGY STAR specific test procedure. Incorporates the following references: IEC 62301, Sections 3.2, 3.3; IEC 4.3.1; VESA Flat Panel Display Measurements (FPDM) Standard 2.0, Sections 301-2, 301-3K, 302-1, and 305-3; VESA FPDM Standard 2.0, Appendices A112-2F, A112-2H, A115, and AT01P; VESA Standard – Display Specifications and Measurement Procedures, Version 1.0, Revision 1.0, Section 8.1.3; European Norm 50301 – BSI 03-2001, BS EN 50301:2001, Methods of Measurement for the Power Consumption of Audio, Video, and Related Equipment, Annex A; and VESA Video Signal Standard (VSIS), Version 1.0, Rev. 2.0, December 2002
	Multi-function devices, Standard sized Laser jet printers	ENERGY STAR specific test procedure
	Ink Jet Printers, Fax machines, Mailing machines	ENERGY STAR specific test procedure
	Scanners	ENERGY STAR specific test procedure
Commercial Food Service	Commercial dishwashers	NSF/ANSI 3-2007; ASTM Standard F-1696; ASTM Standard F1920
	Commercial fryers	ASTM standard F1361-99
	Commercial hot food holding cabinets	ASTM standard F2140-01
	Commercial ice machines	Air-Conditioning and Refrigeration Institute (ARI) Standard 810-2006
	Commercial solid door refrigerators and freezers	ASHRAE standard 117-1992
	Commercial Steam Cookers	ASHRAE standard F1484-99
	Vending machines	ASHRAE standard 32.1-2004 using the test conditions in Section 6
	Water coolers	ENERGY STAR specific test procedure

B. Compliance Audit Program

In addition to reviewing qualification test results, EPA is in the process of broadening its Compliance Audit Program.

EPA's Compliance Audit Program addresses the broad range of eligible product categories through three approaches to verify product performance. These include:

- EPA verification testing, which is administered by EPA using third-party independent laboratories
- Third-party certification testing, which is administered by external, independent organizations
- Quality assurance testing for lighting products

EPA verification testing for products

Verification testing is one of many checks on the certification process that was established to cost-effectively protect the integrity of the ENERGY STAR program. This testing is intended to supplement formal Partnership Agreements and the upfront qualification process that includes standardized, formal test procedures and the review of submitted data. The goal of testing is to identify potential compliance problems and set in motion a review process to ensure manufacturers take corrective measures as appropriate. This testing is also referred to as quality assurance testing, as it is an integral part of the Quality Assurance Program for ENERGY STAR

EPA verification testing can be conducted for any ENERGY STAR qualified product. As specified in Partnership Agreements, EPA may, at its discretion, conduct tests on any products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by a partner at EPA's request. Each year, EPA identifies a set of product categories to test, focusing primarily on products where certification programs do not exist, and coordinates testing with the product specification setting and revision process. EPA may choose to test a product category to inform specification development work or other program priorities.

For each product category, EPA identifies specific models for testing. In general, EPA targets the most popular products on the market, as they reach the greatest number of consumers; however, EPA also considers other factors such as product features, prices, and manufacturers or brand names in making its selection. To date, EPA has conducted testing on the following 10 products:

- Televisions
- DVD products
- Monitors
- Telephony
- Scanners
- Air Cleaners
- Printer & Faxes
- Dehumidifiers
- Computers
- Multi-Function Devices (MFDs) [also referred to as All-in-One Devices and Upgradeable Digital Copiers (UDCs)]

As shown in Table 7 below, out of the 172 models tested to date, three failed compliance testing. These failures ultimately led to the removal of one model from the ENERGY STAR qualified products list.

Table 7. EPA Verification Testing for ENERGY STAR Products

Product	Specification Requirements	Model Selection	# Mfrs	# Units Tested	Characteristics	Passed	Follow On Action
2002							
Televisions	≤ 3 Watts in Standby mode	Chose 15 ENERGY STAR models from among the top 25 TVs in terms of market sales, based on NPD Techworld data for January – March. 2002.	5	45 (3 units of each model)	Screen size 31” – 57”; tube, flat screen, and rear projection technologies	All	Retest in turn
DVDs ¹	For DVDs , ≤ 3 Watts in Standby mode. For DVD/VCR combos , ≤ 4 Watts in Standby mode.	Chose 15 ENERGY STAR and non-ENERGY STAR models from among the top 25 TVs in terms of market sales, based on NPD Techworld data for April – June 2002.	8	45 (3 units of each model)	NA	All ²	Retest in turn
2003							
Monitors ³	≤ 15 Watts in Sleep mode; ≤ 8 Watts in Low-power deep sleep mode	Chose 10 CRT and 5 LCD models from among the top 25 CRT and top 5 LCD monitors in terms of market sales, based on NPD Techworld data for April – June 2002.	7	45 (3 units of each model)	30 CRTs and 15 LCDs; range in screen size 13.8” – 17”	All	Retest after new spec in effect
Telephony ⁴	For answering machines/cordless telephones , ≤ 3.3 Watts in Standby mode (w/SST ≤ 3.6 Watts). For combination cordless telephone & answering machines , ≤ 4.0 Watts in Standby mode (w/SST ≤ 5.1 Watts)	Chose 7 cordless phones, 8 combo phones and answering machines, and 5 handsets from the top 30 cordless phones and combo units in terms of market sales, based on NPD Techworld data for April – June. 2003.	6	50 (3 units of each cordless phone and combo model; 1 unit of each handset model)	24 combo phone & answering machines, 21 cordless phones, 5 handset only	All	Retest in turn

Product	Specification Requirements	Model Selection	# Mfrs	# Units Tested	Characteristics	Passed	Follow On Action
2004							
Scanners ⁵	≤ 12 Watts in Low-power mode; ≤ 15 min default-delay time to Low-power mode	Chose 8 scanner models from the top 30 in terms of market sales, based on NPD Techworld data for June – September 2003. Chose an additional 7 models from other sources to ensure a range of technologies (i.e., flatbed, sheet-fed, network).	7	45 (3 units of each model)	Scan rates 4 – 16 ms/line and 15 –25 ppm	All ⁶	Retest after new spec in effect
MFDs & UDCs ⁷	For MFDs , ≤ (3.85 x ipm + 50) Watts in Low-power mode; ≤ 30 sec recovery time from Low-power mode; ≤ 25 – 105 Watts in Sleep mode, and ≤ 15 – 120 min default-delay time to Sleep mode, based on product speed. For UDCs , ≤ (3.85 x ipm + 5) Watts in Low-power mode; ≤ 30 sec recovery time from Low-power mode; ≤ 5 – 20 Watts in Sleep mode and ≤ 15 – 120 min default delay-time to Sleep mode, based on product speed.	Chose 8 MFDs, 2 UDCs, and 1 digital duplicator based on input from EPA's Product Development Team to ensure a wide array of products and manufacturers were represented. The sample size for this test cycle was small given the higher per unit cost of MFDs and UDCs.	10	11 (1 unit of each model)	5 monochrome and 6 color, range in speed 12 – 120 ipm and 4.9 – 31 ppm	1 MFD model failed by exceeding Sleep mode default time; EPA worked with partner to resolve the issue.	Retest after new spec in effect

Product	Specification Requirements	Model Selection	# Mfrs	# Units Tested	Characteristics	Passed	Follow On Action
Printers & Faxes ⁷	For printers , ≤ 10 – 75 Watts in Sleep mode; ≤ 5 – 60 min default delay-time to Sleep mode, depending on color capability, marking technology, and print speed. For faxes , ≤ 10 – 15 Watts in Sleep mode and ≤ 5 min default delay-time to Sleep mode, based on product speed.	Chose 9 printers, 1 photo printer, and 4 faxes from the top 25 faxes, laser printers, and inkjet printers in terms of market sales, based on NPD Techworld data for June – August 2004.	10	14 (1 unit of each model)	6 monochrome and 8 color, range in speed 3.8 – 33 ppm	1 printer model failed by exceeding Sleep mode default time; model no longer appears on ENERGY STAR Qualified Products List	Retest after new spec in effect
2005							
Dehumidifiers ⁸	Capacity of L/day < 10; EF ≥ 1.20 L/kWh. Capacity of 10 ≤ L/day < 25; EF ≥ 1.30 L/kWh. Capacity of 25 ≤ L/day ≤ 35; EF ≥ 1.50 L/kWh. Capacity of 36 ≤ L/day ≤ 57; EF ≥ 2.25 L/kWh.	Chose 20 dehumidifiers based on input from EPA's Product Development Team to ensure a wide array of products and manufacturers were represented.	11	20 (1 unit of each model)	Rated pints 20 – 101.2/day (9.6 – 47.9 liters); range in rated energy factor 1.3 – 2.75 L/day	All ⁹	Retest after new spec in effect
2006							
Computers ¹⁰	≤ 15 – 50 Watts in Sleep mode, depending on the power supply rating; enter Sleep mode < 30 min.	Chose 16 computers based on input from EPA's Product Development Team to ensure a wide array of configurations and manufacturers were represented.	11	16 (1 unit of each model)	2 notebooks and 14 desktops; memory range 113 – 1,048 MB	All ¹¹	Retest after new spec in effect

Product	Specification Requirements	Model Selection	# Mfrs	# Units Tested	Characteristics	Passed	Follow On Action
Monitors	Active: If $X < 1$ megapixel, then $Y = 23$; if $X \geq 1$ megapixel, then $Y = 28X$ Sleep: ≤ 2 watts Off: ≤ 1 watt	Chose 16 computer monitor models from the top 50 in terms of market sales, based on NPD Techworld data for April – June 2006. Chose an additional 4 models from other sources to ensure a range of manufacturers.	11	20 (1 unit of each model)	LCD models ranging in screen size from 15 to 23 inches	All ¹²	Retest in turn
2007							
Room Air Cleaners	≥ 2.0 CADR/Watt (Dust) and ≤ 2.0 Watts in Standby mode, where applicable	Chose 11 room air cleaner models that were on the ENERGY STAR Qualified Products Listing, but did not appear on AHAM's Directory of Certified Room Air Cleaners	7	11 (1 unit of each model)	NA	1 Room Air Cleaner model failed by not meeting the dust CADR/Watt requirement; EPA worked with partner to resolve issue.	Retest in turn

NOTES:

¹ In addition to compliance testing, a few non-ENERGY STAR models were tested to a) gain an understanding of the Standby mode energy consumption range of the top-selling DVD players, and b) determine whether the non-Audio/DVD partners have models that potentially could qualify.

² All ENERGY STAR qualified models passed the Standby power test. Only one of the non-ENERGY STAR models did not pass.

³ In addition to compliance testing, data were collected to inform specification development activities. F-Squared Laboratories conducted preliminary testing on and provided feedback for the draft Active mode test procedure and tested various voltage/frequency combinations.

⁴ In addition to compliance testing, data were collected to inform specification development work on an amendment for individual handsets and Tier 2 levels.

⁵ In addition to compliance testing, data were collected on non-ENERGY STAR models and for On/Active and Off/Standby modes to support specification development activities.

⁶ All ENERGY STAR qualified models passed the Sleep/Low-power test. A few non-ENERGY STAR models were tested in support of specification development efforts for Imaging Equipment; one of these models did not pass.

⁷ In addition to compliance testing, the new Total Electricity Consumption (TEC) test procedure also was used to inform the specification development process.

⁸ In addition to compliance testing, data were collected to inform specification development activities. Testing was conducted on both ENERGY STAR and non-ENERGY STAR qualified models.

⁹ Initially, one ENERGY STAR qualified model did not pass the test for ENERGY STAR compliance. After testing, Intertek ETL SEMKO examined the internal components of the unit and found some damage, most likely caused during shipping. A new unit was sent to Intertek for testing and it met the ENERGY STAR specifications.

¹⁰ In addition to compliance testing, data were collected on multiple operational modes, including Idle and Off, to inform specification revision activities.

¹¹ All ENERGY STAR qualified models passed the Sleep mode test. Several non-ENERGY STAR models were tested in support of specification development efforts.

¹² One model failed due to a software error. This error was immediately corrected and a new unit was tested to verify compliance.

EPA is planning to increase verification testing given the growth of the ENERGY STAR program and the number of qualified products on the market. For example, EPA is currently working with computer stakeholders to develop a testing program that would be funded by manufacturers and provide for more frequent testing. This program would still be administered by EPA with independent laboratories conducting the testing.

Third-Party certification testing

The second element of EPA's Compliance Audit Program is testing administered by third-party certification programs. There are currently several third-party certification programs, which are funded and administered by industry trade associations that verify product performance. EPA is working to develop more formal relationships with these programs to leverage the extensive testing they already conduct for ENERGY STAR products. These include programs established by trade associations and relied upon by the federal government to ensure compliance with federal energy efficiency standards and other federal programs.

Currently, EPA has identified the following organizations as providing relevant testing:

- Association of Home Appliance Manufacturers (AHAM)
- Air Conditioning, Heating, Refrigeration Institute (AHRI)
- Home Ventilating Institute (HVI)
- Air Movement & Control Association (AMCA)
- Cool Roof Rating Council (CRRC)

In addition, EPA plans to work with Fisher-Nickel, Inc., and the Food Service Technology Center (FSTC) to conduct testing for commercial food service products.

Quality assurance testing for lighting products

EPA established quality assurance testing for RLFs in 2005 under Version 4.0 of the ENERGY STAR specification for RLFs and has subsequently issued quality assurance testing guidelines and procedures. In addition, DOE has developed a quality assurance testing program for CFLs, which will take effect with the 4.0 criteria in December 2008.

Efforts to test residential lighting performance initially were undertaken in 1999 by the Program for the Evaluation and Analysis of Residential Lighting (PEARL), a group of utilities, energy efficiency advocates, and market transformation organizations that focus on residential lighting products and are part of the ENERGY STAR program. PEARL was created in response to complaints received by some utility program managers about the performance of certain ENERGY STAR qualified lighting products being promoted within their service territories. PEARL purchased and tested lighting products that were available to the consumer in the marketplace via the Lighting Research Center (LRC), a testing laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).³ NVLAP provides an unbiased third-party evaluation and recognition of performance, as well as expert technical guidance to upgrade laboratory performance.

³ NVLAP is a voluntary, fee-supported program to accredit laboratories that are found competent to perform specific tests or calibrations, or types of tests or calibrations. The NVLAP was established by National Institute for Standards and Technology in 1976 to serve the needs of the government and private sector by fostering and promoting a uniformly acceptable base of professional and technical competence in the laboratory community, and to facilitate and promote acceptance of calibration and test results between countries to avoid barriers to trade.

To date, PEARL has tested 182 CFL models and 52 light fixture models and shared data on performance failures with EPA and DOE. In response, EPA and DOE have undertaken follow-up action to ensure that quality and performance issues are resolved and/or products are de-listed from the ENERGY STAR qualified products list. While results from PEARL highlighted issues with compliance, the program was also able to demonstrate increasing compliance and product performance in each successive round of testing. EPA decided to develop a testing program specific to RLFs as part of the ENERGY STAR partnership requirements and has established a formal quality assurance testing program involving manufacturer partner participation. DOE has developed a similar program for CFLs which will take effect under 4.0 criteria in December 2008.

The quality assurance testing is intended to drive enhanced quality assurance and quality control processes for manufacturers, which is uniquely lacking for lighting products. Additionally, this testing is complemented by an additional requirement for manufacturers to submit accredited laboratory test data reports to EPA or DOE as part of the initial certification process.

EPA quality assurance testing for residential light fixtures (RLFs)

In October 2005, EPA launched the quality assurance testing program for RLFs. To limit the burden on manufacturers, EPA selects no more than two products from each chosen manufacturer in a given year for this product category. Under the new system, once a product is selected for testing, the manufacturer is required to choose and pay for testing at a manufacturer-independent laboratory that has been certified by NVLAP. The laboratory purchases fixture samples or lamp and ballast platforms on the open market, when possible, to further ensure the integrity of the process. Fixtures that fail the quality assurance testing are disqualified in accordance with the product mislabeling protocol discussed in Section III C.

The first round of testing encompassed 10 fixtures from 10 unique manufacturers. The notification of QA selection began on April 3, 2006.⁴ Two fixtures have been de-listed from the ENERGY STAR Qualified Product List as a result of failures. The second round of testing began in April 2007 and included 12 lamp and ballast platforms from 10 unique manufacturers. To date, two platforms have been de-listed as a result of failures in round two.

DOE quality assurance testing for CFLs

Given product performance concerns and PEARL results for some CFLs, DOE has focused verification testing on ENERGY STAR qualified CFLs. DOE announced final criteria for its revised specification on March 7, 2008. This specification includes a requirement that CFL partners participate in a third-party testing and verification program similar to the manufacturer testing approach adopted for residential lighting fixtures.

Since PEARL began testing CFLs in 1999, 75 out of 182 CFL models failed to meet all ENERGY STAR requirements. Of these 75 CFLs, 23 remain listed because the manufacturer corrected the failure or the product was retested and met performance criteria, and one product was disqualified due to specification revision. Table 8 provides results from CFL testing under the PEARL initiative.

⁴ Two secondary selections were notified after this date (April 22 and May 23, respectively).

In addition to PEARL testing, DOE initiated the Mandatory CFL Reflector Testing Initiative in October 2004, based on manufacturer input, which requires all qualified CFL reflector models to be tested. Models that were not submitted for testing were removed from the Qualified Product List on the ENERGY STAR Web site, and all retailer and energy efficiency program administrators were informed of the de-listings. Testing was completed on December 16, 2005 and 50 CFL reflector products out of 65 were disqualified from the program. Out of the 50, 31 of the disqualified products were tested (the remainder were corresponding private labeled products).

Out of the 65 CFL reflector products tested, 92 percent met the efficacy requirement, 91 percent met the rapid cycle stress test requirements, 63 percent met the 1,000-hour lumen maintenance requirement, and 68 percent met the lumen maintenance (at 40 percent) requirements. Based on these results, DOE has incorporated an elevated temperature testing requirement for all reflector products that are designed for use within recessed cans and other enclosed fixtures within the Version 4.0 ENERGY STAR criteria for CFLs (effective December 2, 2008).

Table 8. PEARL Testing for ENERGY STAR Qualified CFLs

Year	Number of CFLs Tested	Number of Unique Models That Failed to Meet All Criteria Requirements	Number of Unique Models Where Manufacturer Corrected Failure or Models Were Retested and Met Criteria	Number of Unique Models No Longer Qualified Due to Revised Specification	Number of Unique Models Delisted
1999 Cycle 1	10	5	5	0	0
2001 – 2002 Cycle 2	18	9	6	0	3
2002 – 2003 Cycle 3	20	10	3	0	7
2003 Cycle 4	20	9	1	1	7
2004 Cycle 5	18	8	2	0	6
2005 Cycle 6	34	9	6	0	3
2006 Cycle 7	33	15	0	0	8
2007-08 Cycle 8 ⁵	29	10	Pending	0	5
Total	182	75	23	1	39

The quality assurance testing program for lighting products, along with EPA verification testing and third-party certification testing, are all key elements of EPA’s Compliance Audit Program. A product is determined to have failed verification testing under EPA’s Compliance Audit Program if: a) the testing information supplied by the laboratory or manufacturer is complete but indicates the product does not meet the performance requirements; b) the testing information supplied by the laboratory or manufacturer is insufficient to determine whether the product meets the performance requirements; or c) the manufacturer fails to respond to EPA requests for additional documentation or testing. EPA follows an established response protocol in addressing product mislabeling as described in the following section.

⁵ Cycle 8 testing was not complete for all products at time of writing.

C. *Product mislabeling protocol*

EPA and DOE follow an established response protocol in addressing product mislabeling. Mislabeled products are generally identified through one of the three mechanisms: 1) retail store level assessment, 2) the Compliance Audit Program, or 3) manufacturer reporting or self-disclosure.

The protocol includes the following key steps:

- 1) EPA or DOE notify the product manufacturer that the product will be removed from the ENERGY STAR Qualified Product List on the Web site and requests a corrective action plan. Partners found with mislabeled products in the market as ENERGY STAR may face termination of their Partnership Agreements.
- 2) Upon notification, the manufacturer must immediately: 1) stop shipment of the model with the ENERGY STAR mark; 2) suspend the labeling of the unqualified⁶ product with the ENERGY STAR mark; 3) remove or obscure the ENERGY STAR mark on product units within its control; and 4) remove or obscure the ENERGY STAR mark on all collateral materials such as product packaging Web pages and other marketing materials associated with the product. Depending on the amount of mislabeled product in the distribution chain and the nature of the distribution, EPA or DOE may require the manufacturer to remove or obscure labels on products already shipped. The manufacturer must provide EPA with a corrective action plan within 30 days of receiving written notification from EPA. This plan should confirm that the above actions were/are being taken in addition to informing EPA if the manufacturer plans to re-qualify the model at a later date. EPA and/or an ENERGY STAR representative will work with the manufacturer throughout the process until it is considered resolved by the Agency.
- 3) For products that are commonly sold through retail channels and/or subject to financial incentives, EPA or DOE may notify retail partners and Energy Efficiency Program Sponsors (EEPS) that a product is considered “unqualified” and has been de-listed from the ENERGY STAR Web site. EPA or DOE will consolidate individual notices into one written letter if multiple products are deemed unqualified at the same time.

At any time, the manufacturer may resubmit products with appropriate test data for re-qualification.

As the ENERGY STAR name and logo are registered marks belonging to the U.S. government, EPA must ensure they are used correctly to protect the integrity of the program they represent. Any partner that uses the name and/or logo improperly and fails to take corrective action upon an EPA request may be subject to termination of its ENERGY STAR Partnership Agreement, as well as legal action through EPA’s Office of General Counsel.

⁶ An “unqualified” product is a product that does not meet the current ENERGY STAR program and specification requirements.

D. Qualification and verification testing requirements for homes

From 1995 through 2006, the ENERGY STAR specification for new homes was a Home Energy Rating System (HERS) score of 86. This score approximated a 30 percent energy efficiency improvement for heating, cooling, and hot water over a home built to the national Model Energy Code (MEC). In addition, EPA developed prescriptive designs called Builder Option Packages (BOPs) that detailed how builders could construct ENERGY STAR qualified homes without a home energy rating. This specification was amended in 2000 to also require at least 15 percent greater efficiency than the prevailing state energy code to ensure labeled homes were substantially more energy efficient than standard homes in states with rigorous energy codes (e.g., California, Texas). EPA subsequently revised this specification for site-built homes during 2005, increasing stringency in response to a much more rigorous national energy code (now called International Energy Conservation Code or IECC) and substantially higher cooling equipment standards under National Appliance Energy Conservation Act (NAECA).

The revised specification requires an ENERGY STAR labeled home to be 15 to 20 percent more efficient than a home built to the 2004 IECC. In addition, EPA requires additional energy saving features (thermal bypass checklist) that typically make them 20 to 30 percent more efficient than standard homes. The date for full national implementation of this specification was July 1, 2007.

Builders can meet these performance targets by constructing homes that score either an 80 or 85, depending on the climate zone, on the HERS scale. Such evaluations or ratings are conducted according to standards set by the Residential Energy Service Network (RESNET), under Chapter 3 (National Energy Rating Standards) of the Mortgage Industry National Home Energy Rating Systems Standards. Or, builders may use EPA-approved BOPs designed to meet or exceed ENERGY STAR performance criteria in designated climates.

- **Qualifying homes on a performance basis.** To qualify as ENERGY STAR, a home must:
 - (1) Meet the appropriate HERS Index and other mandatory requirements for home envelope, ductwork, and products
 - (2) Be verified and field-tested in accordance with the RESNET Standards by a RESNET-accredited Provider
 - (3) Have completed the Thermal Bypass Inspection Checklist
 - (4) Have installed various combinations of ENERGY STAR qualified products and appliances
 - (5) Meet all applicable codes

- **Qualifying homes on a prescriptive basis.** To qualify as ENERGY STAR, a home must:
 - (1) Be built to the requirements specified in the appropriate ENERGY STAR BOP. All BOP requirements are verified by an independent, third-party accredited provider according to Chapter 4 of the Mortgage Industry National Home Energy Rating Systems Standards maintained by RESNET
 - (2) Have completed the Thermal Bypass Inspection Checklist
 - (3) Meet all applicable codes

Multi-family units that are three floors or less can qualify for ENERGY STAR if the end-unit with the most exposed wall area meets the appropriate HERS Index for its climate zone. In addition, the other dwellings must have equal or lesser window area to floor area ratio, as well as the same or more

stringent energy efficiency features as the tested unit. For the prescriptive path, EPA has developed a new BOP that is similar to the one developed for detached housing, but it allows builders to select additional energy efficiency features in exchange for not installing a high-efficiency HVAC system.

Verification of site-built homes

Site-built homes are inspected and verified as meeting ENERGY STAR specifications by either a certified HERS rater working for an accredited HERS provider or an accredited BOP provider. The HERS rater determines whether the home meets the ENERGY STAR performance specification. The BOP provider verifies that the home has been built to the prescriptive BOP.

Field inspection and testing is either conducted on every home or through a sampling protocol when certain conditions are met.⁷ 'Sampling' allows an accredited Home Energy Rater provider to qualify a group of new homes to meet ENERGY STAR guidelines based on pre-analysis of building plans and subsequent random testing and inspections of a sample set of the homes as-built. For builders who have demonstrated an ability to consistently meet the ENERGY STAR guidelines, sampling helps to minimize production interruptions and verification costs, while ensuring that homes meet or exceed the guidelines for qualifying homes as ENERGY STAR. Sampling can be applied when either the performance verification method (HERS Index score) or prescriptive verification method (BOP) is used.

RESNET has amended Chapter 6 of the Mortgage Industry National Home Energy Rating Standards that governs the application of a recognized Sampling Protocol and the accreditation of Sampling Providers. This RESNET standard was developed by a panel of building science professionals with extensive experience working with builders in the field and was reviewed through a public comment period. This RESNET Standard has been adopted by EPA.

In addition to the above quality assurance verifications, EPA 1) reviews evaluation reports from energy efficiency program administrators who conduct evaluations to verify energy savings and peak demand reductions; and 2) actively investigates complaints from consumers regarding their homes or the home energy rating process. In cases where EPA confirms that non-compliant homes are being verified or promoted as ENERGY STAR, action is taken to resolve noncompliance and/or terminate the ENERGY STAR partnership with the builder or rater.

Manufactured homes

An ENERGY STAR qualified manufactured home is 30 percent more energy efficient than a home built to the 1993 Model Energy Code. Since manufactured homes come under a different building code than site-built homes, EPA did not revise the specification for this housing type in 2005. In addition, EPA allows an additional verification path for manufactured homes to account for the inherently higher-quality insulation installation procedures and more complete thermal air barrier details that can be diligently followed and installed in the factory setting where these homes are manufactured.

To earn the ENERGY STAR, a plant must first be certified to produce ENERGY STAR qualified homes by an independent ENERGY STAR certifier. Approved quality assurance providers currently

⁷ Prior to formal adoption of a sampling protocol option, the validity of the approach was verified in three markets where the sampling protocol was being pilot tested. Source: ICF 2000. Field Evaluation of EPA's ENERGY STAR Homes Sampling Protocol November 2000. Independently, the Ohio State Energy office conducted a similar field study in 2001. In both studies, compliance with ENERGY STAR specifications was excellent.

include a provider overseen by the Northwest Energy Efficiency Alliance and the Manufactured Housing Research Alliance. To be certified, a plant must select energy efficiency measures that help achieve the ENERGY STAR specification, submit those measures to a design approval primary inspection agency (DAPIA) accredited by the U.S. Department of Housing and Urban Development (HUD), and then verify consistent conformance to those measures both in the plant and with assembled homes to a quality assurance provider. Once a plant is certified, the verification process entails checking:

- At least one step of the production-line process by third-party in-plant inspection agents accredited by HUD
- All steps of the production-line process by in-house quality control managers reviewing detailed checklists including all ENERGY STAR requirements
- Assembled units in the field by factory quality control representatives and quality control checklists with ENERGY STAR requirements

Furthermore, EPA requires that at least 2 percent of all labeled homes be spot checked in the field with diagnostic testing by a third-party ENERGY STAR Certifier.

Home Performance with ENERGY STAR

Although any existing home that meets the ENERGY STAR specification for new homes may be labeled as ENERGY STAR, it is not cost effective for the majority of older homes to install upgrades and make renovations to meet these stringent criteria. Many cost-effective opportunities for reducing energy consumption in existing homes, however, are available. The Home Performance with ENERGY STAR program is designed to identify and deliver these opportunities to the existing homes marketplace. The program is underway in over 20 metropolitan areas of the country and is operated by program sponsors. To offer a Home Performance with ENERGY STAR program, the program sponsor is required to develop and submit an annual program plan outlining implementation of the following program elements:

- **Ensure that energy specialists conduct whole-house analyses**, including a complete visual and diagnostic energy inspection of the home's thermal and mechanical systems (attics, exterior walls, infiltration, windows, basement, heating and cooling systems, and hot water systems). A visual inspection of the home's lighting and appliances also is recommended. Additionally, ensure that all recommendations to the homeowner are made on a fuel-neutral basis and ensure that the homeowner (or tenant) is provided with a summary report, including results and recommendations, expected costs and savings, and the non-energy benefits of implementing recommendations.
- **Facilitate installation of recommended measures** through information, marketing, financial incentives, and/or financing, placing emphasis on the installation of recommended measures, including but not limited to insulation, air sealing, heating, cooling, and duct system improvements, and energy-efficient lighting and appliance upgrades.
- **Facilitate direct connection of homeowners to appropriate qualified contractors** who are able to implement the recommendations. This can be either by the contractor providing the inspection or other contractors qualified in home energy inspection, building science, and proper installation techniques. All measures are required to be installed in accordance with industry best practices.

- **Verify energy performance and conformity to health and safety standards** through diagnostic testing that includes measuring air infiltration and duct leakage and combustion safety testing [for example, in accordance with ASTM Standard E1998-99, “Standard Guide for Assessing Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances;” Section H of the National Fuel Gas Code (ANSI Z223.1/NFPA 54); or Canada General Standards Board-51.71-95, “The Spillage Test Method to Determine The Potential for Pressure Induced Spillage from Vented, Fuel-Fired, Space Heating Appliances, Water Heaters and Fireplaces”].
- **Ensure quality through rigorous contractor certification and accreditation or through direct oversight and inspection** as detailed below:
 - **Certification/accreditation.** The certification/accreditation must be at least as rigorous as the technical certifications offered by the Building Performance Institute. Required elements include 1) written and performance-based skill evaluations in all relevant areas; 2) evaluation against consensus-based building science standards; 3) an accreditation agreement in which the contractor performing the work agrees to meet consensus-based building science standards for all work performed, using oversight by certified technicians with appropriately trained crews; and 4) a contractor agreement to establish and use internal quality control and consumer complaint resolution procedures. In addition, contractors must agree to oversight, such as review of records and job inspections by the certifying/accrediting body or the energy efficiency program administrator.
 - **Inspection oversight.** The energy efficiency program administrator will ensure that participating contractors receive building science and measurement training sufficient to perform the diagnostic testing and properly install improvement measures. Further, the program administrator or designated agent will directly inspect the completed work at no less than a 15 percent sampling rate to ensure that cost-effective recommendations are being reasonably presented to homeowners and those measures are performed according to established standards.

Partners that are not meeting the basic requirements of the Partnership Agreement receive a call explaining EPA concerns and requesting resolution. Partners that do not take action within 6 months of being contacted will receive a letter terminating the Partnership Agreement.

EPA and DOE are currently developing more specific guidance related to the implementation steps listed above. Home Performance with ENERGY STAR is jointly managed by EPA and DOE.

Section IV. Assessing consumer experience and perception of ENERGY STAR

EPA and DOE assess the consumer experience with and perceptions of ENERGY STAR by:

- Annually conducting a national analysis of household awareness of, understanding of, influence of, and loyalty to ENERGY STAR
- Assessing whether and how retail sales associates present information about energy efficiency and ENERGY STAR to their customers

A. *Household awareness of, understanding of, use of, and loyalty to ENERGY STAR*

Since 2000, EPA has produced a national analysis of household perceptions of ENERGY STAR based on a data set made publicly available by the Consortium of Energy Efficiency (CEE).⁸ The analyses show that since 2000, consumer awareness of, understanding of, influence of, and loyalty to ENERGY STAR has increased significantly.

As shown in Figures 2 and 3, in 2007, more than 70 percent of households nationwide recognized the ENERGY STAR label and more than 75 percent correctly interpreted the meaning of the ENERGY STAR label.⁹

As shown in Figures 4 and 5, of the one in three households that knowingly purchased an ENERGY STAR qualified product in 2007, more than 70 percent of them reported the label as influential to their purchasing decision, and more than 80 percent of them reported they are likely to recommend ENERGY STAR products to friends.¹⁰

⁸ CEE members comprising state, utility, and third-party energy efficiency program administrators sponsor a household survey about ENERGY STAR in the fall of each year to evaluate the effectiveness of their own energy efficiency campaigns and program tactics.

⁹ EPA Office of Air and Radiation, Climate Protection Partnerships Division. "National Awareness of ENERGY STAR for 2007: Analysis of CEE Household Survey." U.S. EPA, 2007.

¹⁰ Ibid.

Figure 2. Awareness of ENERGY STAR

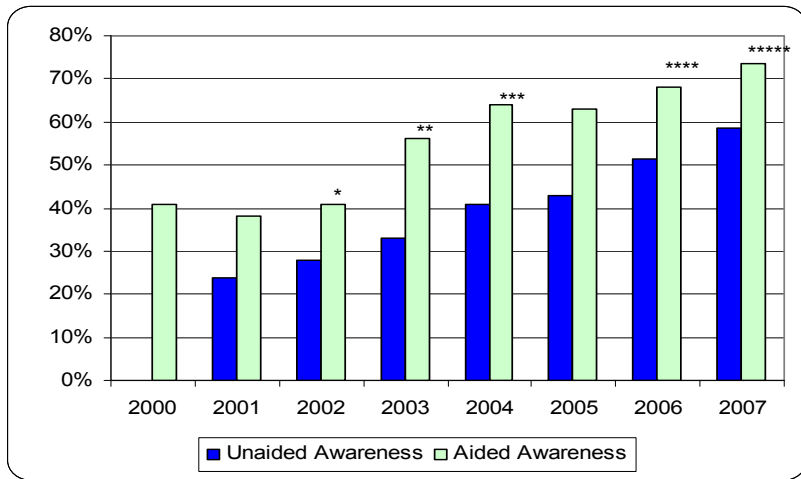
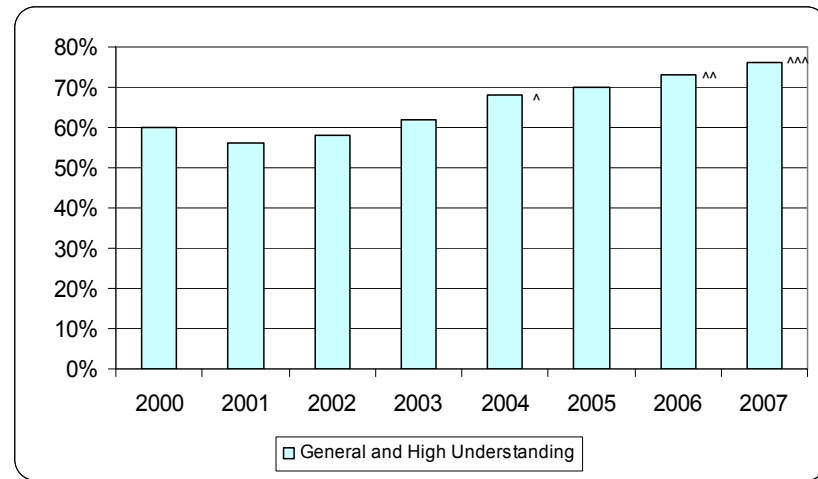


Figure 3. Understanding of ENERGY STAR Label



* Unaided recognition, the 2001 and 2002 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).
 ** Aided recognition, the 2002 and 2003 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01). For unaided recognition, the 2002 and 2003 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).
 *** Aided and unaided recognition, the 2003 and 2004 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).
 **** Aided recognition, the 2005 and 2006 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05). For unaided recognition, the 2005 and 2006 proportions are statistically different from each other at the 1-percent level of significance (p-value ≤ 0.01).
 ***** Aided and unaided recognition, the 2006 and 2007 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).
 ^ Level of understanding, the 2003 and 2004 proportions are statistically different from each other at the 5-percent level of significance (p-value ≤ 0.05).
 ^^ CEE made a change to the 2006 survey that affects the calculation of the Level of Understanding of the Label, which is based on the responses to an open-ended question. In previous years all respondents were asked the question. In the 2006 survey, due to a new skip pattern, 339 respondents were not asked this question. Therefore, it was not possible to determine the Level of Understanding of the Label for these 339 respondents. For comparison purposes, responses for this same subset of respondents were removed from the 2005 calculations. When compared with the 2005 results using all respondents, there is minimal difference.
 ^^ In 2007, the survey reverted back to the skip patterns used prior to 2006; therefore the 2007 results can be directly compared to the 2005 results. The 2007 and 2005 proportion of households with at least a general understanding of the ENERGY STAR label are statistically different at the 5-percent level of significance (p-value ≤ 0.05).

Figure 4. Influence of ENERGY STAR Label on Purchasing

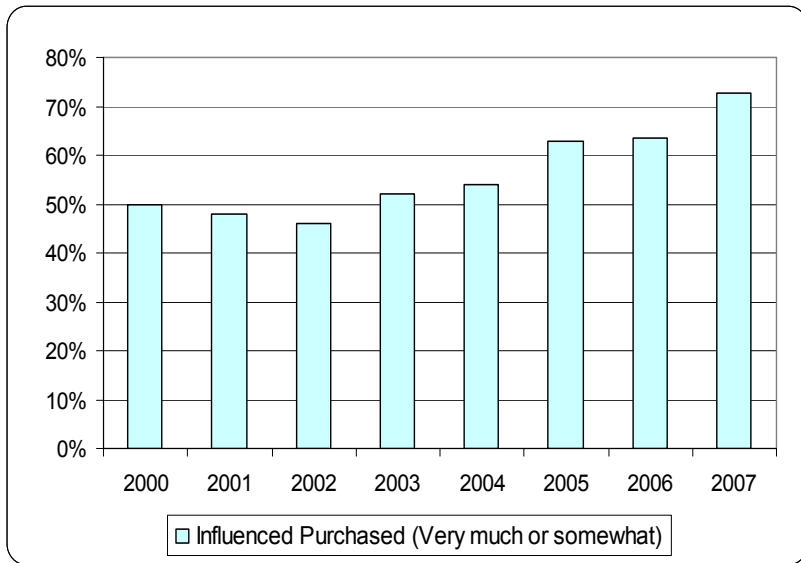
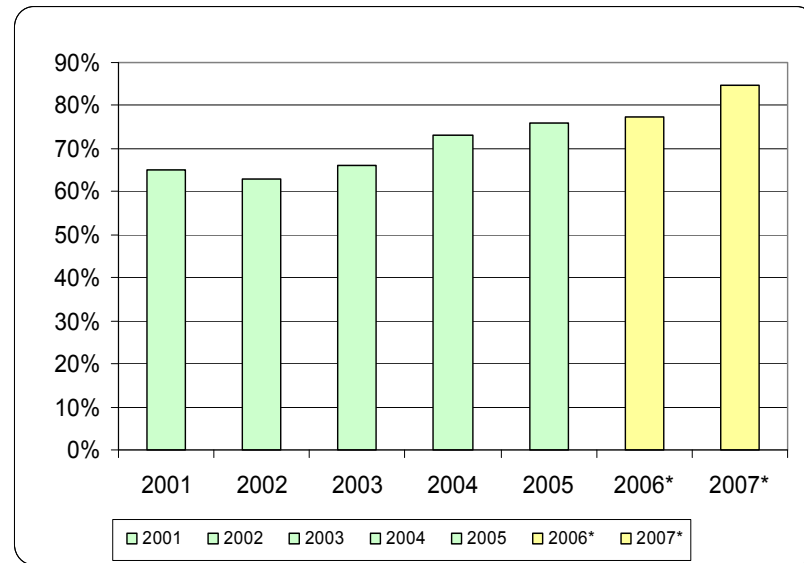


Figure 5. Likely to Recommend ENERGY STAR to a Friend



* In 2006 and 2007, the response options for survey question Q11 ("How likely are you to recommend ENERGY STAR-labeled products to a friend") were changed from previous years. Thus, 2006 and 2007 data are not directly comparable with the 2001 – 2005 data series. Values shown for 2006 and 2007 represent individuals whose responses were from 6 – 10 on a scale where 0 = Extremely Unlikely and 10 = Extremely Likely. Values for 2001 – 2005 represent individuals whose responses to Q11 were either "Very Likely" or "Somewhat Likely" given response options of "Very Likely," "Somewhat Likely," "Slightly Likely," and "Not at All Likely."

B. Sales staff evaluation

As discussed previously in Section II B, EPA conducts a semi-annual retail store level assessment. A key component of the review is an assessment of the retail sales staff, which involves field staff posing as shoppers seeking purchasing advice based on standard situations for designated products. Following each shopping experience, field personnel rate salesperson use and knowledge of ENERGY STAR. Salespeople who mention ENERGY STAR without prompting, explain ENERGY STAR and its sponsorship by EPA and DOE accurately, and present ENERGY STAR, energy efficiency, and environmental benefits as top considerations receive the highest assessments. Since 2001, field personnel have interacted with more than 12 unique stores across 16 product categories. The information captured from these interactions allows EPA and DOE to refine the information and tools they provide to retail partners.

From 2001 to 2007, sales staff using ENERGY STAR as part of the sales process has increased across several key product categories.¹¹

Field personnel agreement levels over time for some of the key assessment areas are presented in Figures 6 through 9 below.

¹¹EPA Office of Air and Radiation, Climate Protection Partnerships Division. "ENERGY STAR Retail Store-Level Assessment Round 11/ Fall 2007 (DRAFT)." U.S. EPA, 2008.

Figure 6. Retailer Familiarity with ENERGY STAR

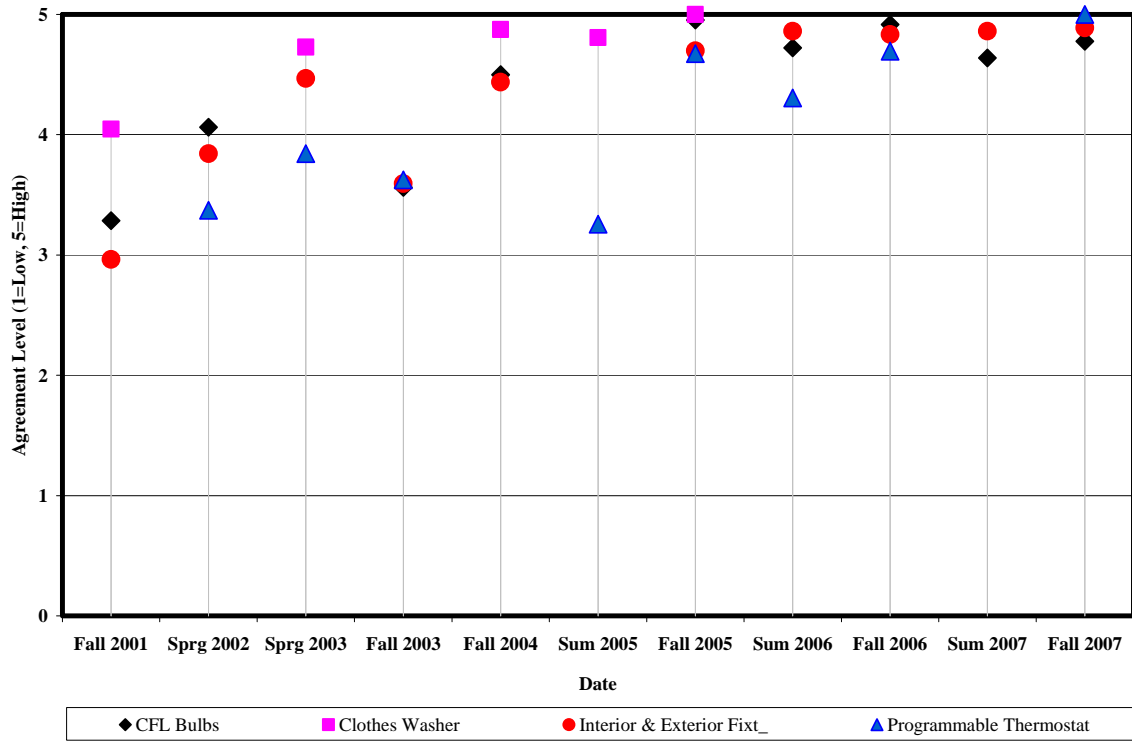


Figure 7. The Retailer Provision of Basic Explanation of ENERGY STAR

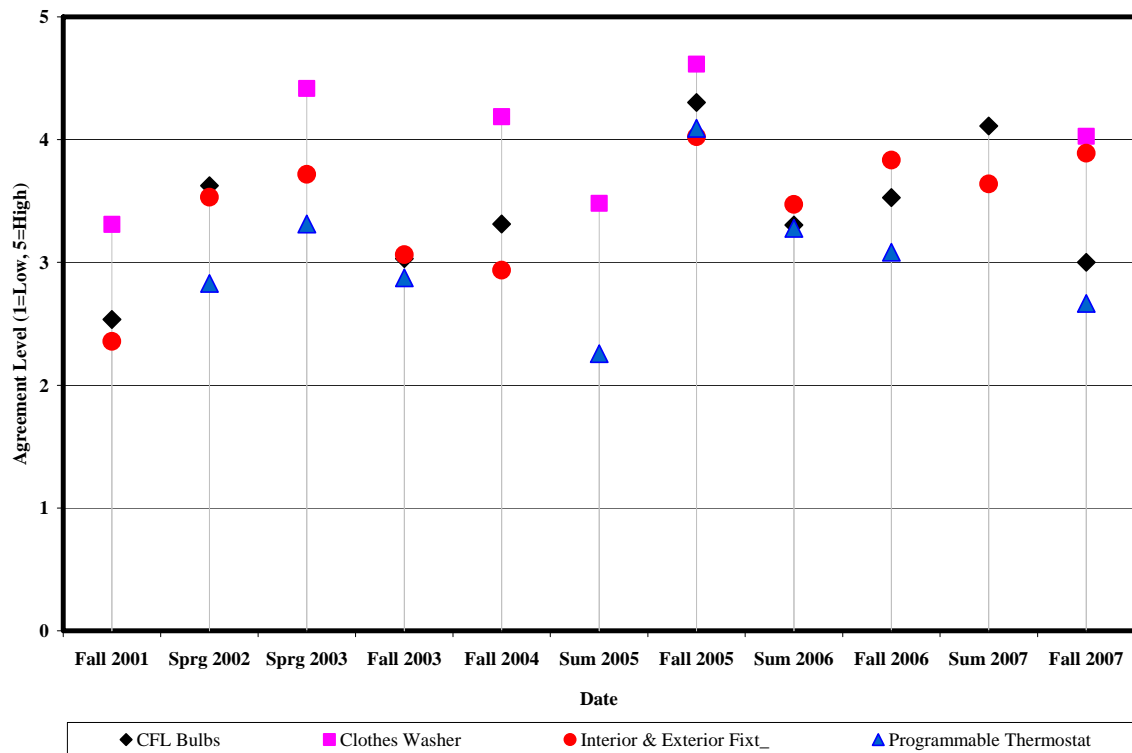


Figure 8. Retailer Directed the Consumer to Energy Efficient Products

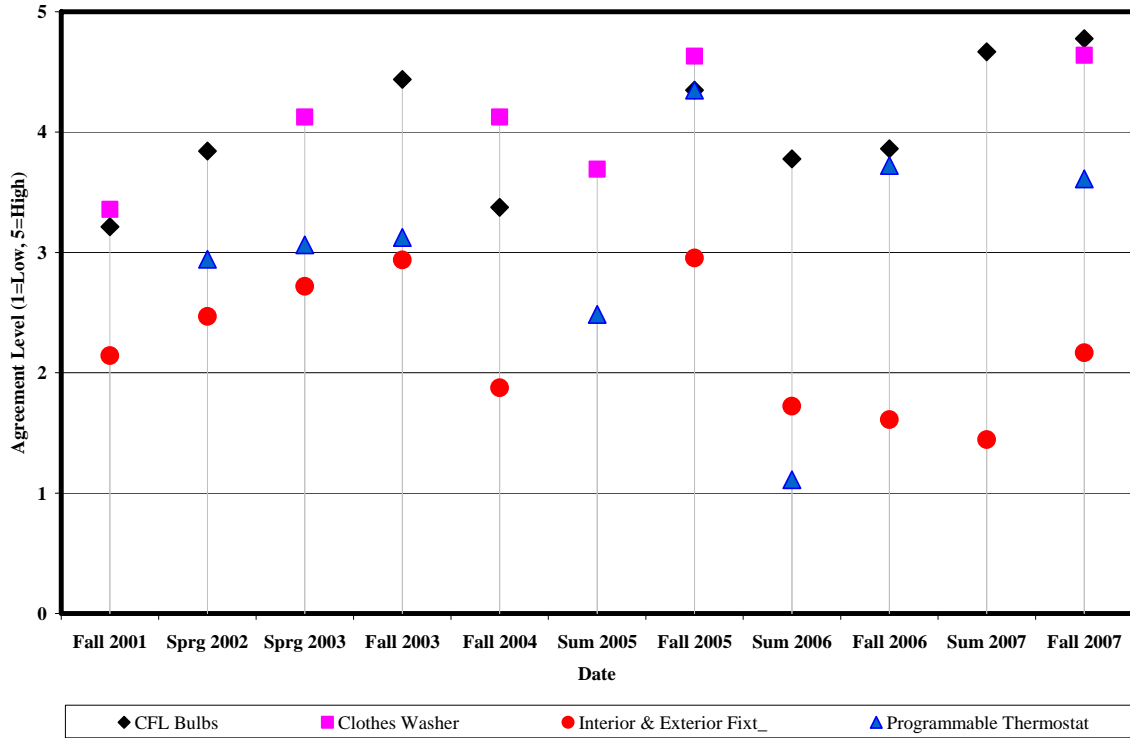
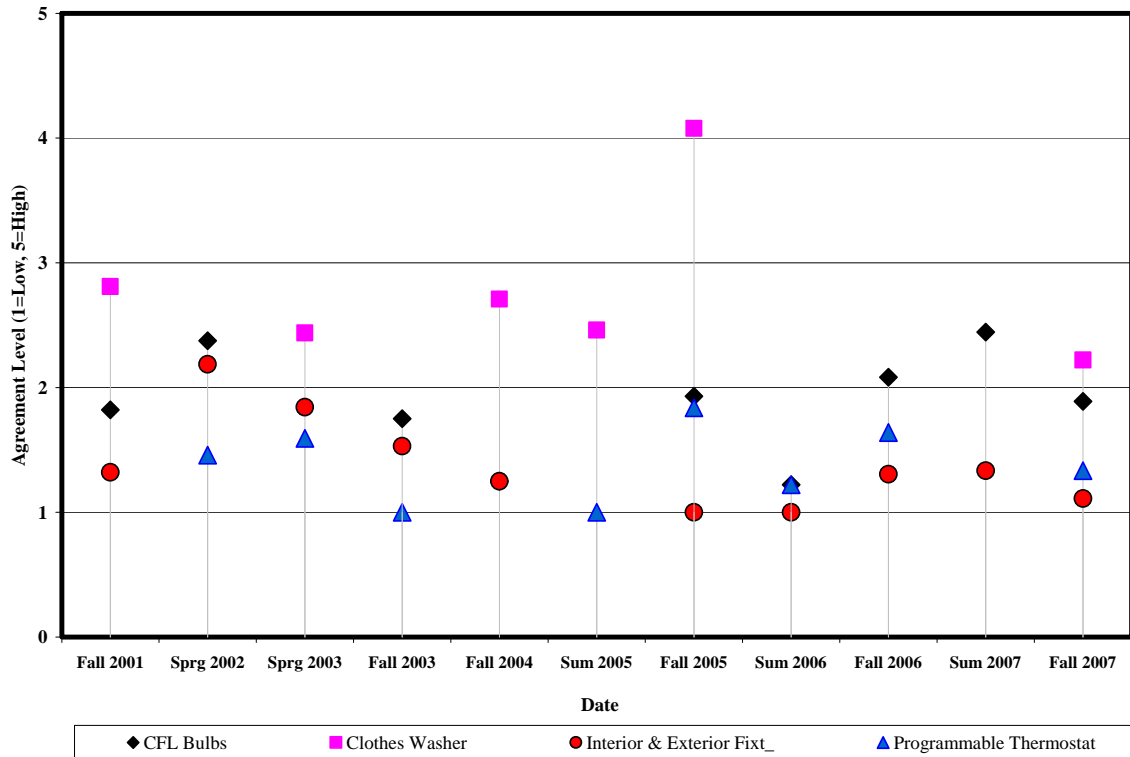


Figure 9. Retailer Mention of ENERGY STAR by Name Without Prompt



Section V. Establishing and revising ENERGY STAR specifications

Establishing and revising ENERGY STAR specifications using consistent and fair principles is important to maintaining the integrity of ENERGY STAR in the marketplace and ensures that:

- Consumers have a consistent understanding of and experience with the ENERGY STAR label
- Manufacturers, builders, and other suppliers are not unfairly disadvantaged
- The nature of the program, as invested in by existing program partners, is not adversely impacted due to the introduction of additional ENERGY STAR qualified products or services

The information provided below describes the principles, processes, and progress that EPA and DOE have made in developing and revising specifications to achieve greater energy performance and maintain differentiation for ENERGY STAR in the marketplace.

A. *Guiding principles for developing and revising ENERGY STAR specifications*

Key principles of the ENERGY STAR brand and attributes of the products that earn the ENERGY STAR include:

- Provide simple ways for consumers to find and select energy-saving products and practices
- Deliver real energy savings to the consumer
- Are fully commercialized and use proven technologies
- Will be cost effective, offering a payback in a reasonable period of time if there is a higher initial cost for the product
- Will provide the same, if not better, performance compared to the typical alternative
- Provide technology-neutral performance requirements across competing technologies

In summary, the ENERGY STAR label is a “trustmark” for consumers based on the large government and stakeholder investment to date and it is that value that EPA strives to continue to build and maintain.

Implementation of the principles listed above is distilled into a short set of key attributes about the market characteristics of the products that would be eligible for the ENERGY STAR label. In addition, questions can be posed to assist in assessing the consistency of the implementation of these principles across the product categories and products eligible for the ENERGY STAR. These market characteristics as well as key questions are detailed below and can be examined on a product basis in Table 9.

- **Products must be clearly and broadly accessible in the marketplace to be candidates for ENERGY STAR.** ENERGY STAR is used to help a broad set of consumers easily make energy-efficient choices when they are in the market to buy or replace products. Thus, highlighting products to consumers that are not broadly available is not helpful and confuses consumers about

the role of ENERGY STAR and the value that ENERGY STAR offers them, as well as potentially undermining the overall ENERGY STAR brand.

Key Questions:

- Are the products eligible for the ENERGY STAR label broadly available to the typical consumer in the places these consumers purchase the products?
 - Are the products eligible for the ENERGY STAR label broadly available to the typical consumer in the places these consumers purchase across the country?
- **Products must have an energy savings potential that translates into tangible energy savings when the product is placed in a home or building to be a candidate for the ENERGY STAR.** It is important that consumers receive the expected energy savings (and expected payback) from the purchase of ENERGY STAR qualified products. If there are issues with installation or system integration that can have a significant impact on a consumer's ability to realize the savings from the product's energy efficiency, then the savings are not guaranteed. As a result, EPA is very cautious about labeling products that are components of larger building or industrial systems. In an early part of the exploration process, EPA determines if there are systems design, integration, and/or installation issues. If there are significant issues, EPA does not consider the product category a viable candidate for the ENERGY STAR program.

Key Questions:

- Are there significant installation issues that would cause the typical consumer to not receive the anticipated energy savings from the products?
 - Are there significant systems interactions and design issues that would cause the typical consumer to not receive the anticipated energy savings from the products?
- **Products must be fully commercialized and use proven technologies to be candidates for the ENERGY STAR.** The energy savings to the consumer (and the expected payback) have to be routine and reliable, which means the technology has to also be proven and reliable.

Key Questions:

- Are the energy-efficient technologies proven in the marketplace and is there a track record of these technologies working?
 - Are there significant consumer complaints associated with the energy-efficient products in the product category?
- **Products must offer payback in a reasonable timeframe to be a candidate for the ENERGY STAR.** ENERGY STAR is designed to appeal to a broad base of consumers and to do so, a strong financial case is critical. Specifications are set with reasonably short paybacks when there is an incremental initial cost for the product. It is important for consumers that purchase ENERGY STAR qualified products to be financially better off investing in energy-efficient products than investing in similar alternatives. The specifications for ENERGY STAR are typically set at performance levels where there is broad availability of products offering two- to three-year simple paybacks. Additionally, consumers have strong preferences for specific features in a product, and there needs to be available efficient products to fulfill these preferences. Many of the current ENERGY STAR products have no significant additional up-front cost and, at most, these products have about a 5-year payback. There are complexities that need to be addressed when the energy use of a product is climate dependent, such as with air conditioners and furnaces.

Key Questions:

- Is there a range of products that meet the ENERGY STAR specification that have the features consumers typically prefer and purchase?
- What is the payback for the products that meet the ENERGY STAR performance requirement for the consumer?
- Are there regional climate issues to address and if there are, has the specification been set so that the large majority of consumers will have a reasonable payback, recognizing that setting the specification to be cost-effective for all consumers is not the best solution?

- **Products should have ENERGY STAR specifications developed only where energy-efficient product performance can be maintained or enhanced.** Market research shows that consumers do not want to compromise product performance as they seek opportunities to lower their energy bills or protect the environment. In developing ENERGY STAR specifications, care is necessary to identify any performance issues with energy-efficient products and to address the performance issues effectively through the specification. If the performance issues cannot be effectively addressed through the specification, the product category is likely not a viable candidate for the ENERGY STAR program.

Key Questions:

- Have performance issues been identified with the energy-efficient products in the product category?
- Have performance issues been addressed in the ENERGY STAR specification?
- Are there significant consumer complaints associated with energy-efficient products in the product category?

- **Products should have ENERGY STAR specifications developed as performance based and technology neutral across competing technologies.** ENERGY STAR is a marketing tool that may convey a business advantage to manufacturers that use it. As such, the government needs to establish specifications that do not favor one manufacturer or technology over another. The government cannot be seen as being arbitrary in the guidelines it sets for energy efficiency. Being technology neutral and performance based does not necessarily mean that the same performance requirements will be required across all fields. For example, in the case of electric- and gas-fueled products, consumers have already chosen a fuel and are looking to choose the cost-effective option for that given fuel. In this scenario, requiring a consumer to change to products of another fuel would typically cost substantially more money and not meet the cost-effectiveness guidelines established earlier for the ENERGY STAR program.

Key Questions:

- Are there a variety of energy-efficient technologies that provide a similar function (e.g. lighting or television viewing)?
- Is the ENERGY STAR specification technology neutral and performance based?
- Are there reasons why a performance-based, technology-neutral requirement does not make sense (e.g. in the case of a gas versus electric products example detailed above)?

The above guiding principles are used to determine whether specifications for existing products should be revised or whether technologies have matured (or failed to mature) to the point that using the ENERGY STAR label in conjunction with a product or service is no longer in the best interest of the EPA, DOE, or consumers (i.e., no longer a cost-effective performance differentiator).

The markets for each product and service labeled as ENERGY STAR vary widely. As such, there is no set market penetration level that triggers a specification review. Rather, the patterns of market share growth and other factors, such as relevant legislation, are monitored over time to anticipate the need for change.

**Table 9. Key Principles and Associated Product Review Questions
(as of December 2007)**

Product Category	Product Available	Significant Issues with Consumer Realizing Expected Savings or Payback			Proven Technology		Cost-Effective		Maintain Performance	Technology Neutral	
	Broadly Available?	Proper Use Issues?	Installation Issues?	Systems/Design Issues?	Proven?	History of Issues?	Simple Payback	Regional climate Issues?	Performance Issues Identified	Different efficient technologies exist with similar functions?	Technology neutral specification?
Appliances											
Clothes washers	Yes	No	No	No	Yes	No	3-5 yrs	No	No	Yes	Yes
Dehumidifiers	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
Dishwashers	Yes	No	No	No	Yes	No	3 yrs	No	No	Yes	Yes
Refrigerators and freezers	Yes	No	No	No	Yes	No	3-5 yrs	No	No	Yes	Yes
Room air conditioners	Yes	No	No	No	Yes	No	0-5 yrs	Yes ¹³	No	Yes	Yes
Room air cleaners	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
Heating and Cooling											
Boilers	Yes	No	No	Yes ¹⁴	Yes	No	<1 yr	Yes ¹³	No	Yes	Yes
Ceiling fans	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
Central air conditioners and air source heat pumps	Yes	No	Yes ¹⁴	Yes ¹⁴	Yes	No	<5yrs ¹⁵	Yes ¹³	No	Yes	Yes
Furnaces	Yes (gas)	No	No	Yes ¹⁴	Yes	No	<3yrs	Yes ¹³	No	Yes	Yes
Geothermal heat pumps	Yes ¹⁶	No	No	No	Yes	No	<5yrs	Yes ¹³	No	No ¹²	No ¹⁷

¹² Function of products currently performed by one basic technology.

¹³ Payback varies depending on heating/cooling loads.

¹⁴ EPA is launching an HVAC Quality Installation program in 2008 to address proper sizing and other installation issues.

¹⁵ Significant cooling load is assumed to be >1089 cooling degree days. Includes cities as far north as New York and Philadelphia.

Product Category	Product Available	Significant Issues with Consumer Realizing Expected Savings or Payback			Proven Technology		Cost-Effective		Maintain Performance	Technology Neutral	
	Broadly Available?	Proper Use Issues?	Installation Issues?	Systems/Design Issues?	Proven?	History of Issues?	Simple Payback	Regional climate Issues?	Performance Issues Identified	Different efficient technologies exist with similar functions?	Technology neutral specification?
Light commercial HVAC	Yes	No	No	No	Yes	No	<1yr	Yes ¹³	No	No ¹²	Yes
Programmable thermostats	Yes	Yes ¹⁸	No	No	Yes	No	0 yrs	No	No	No ¹²	Yes
Ventilating fans	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
Home Electronics											
Battery charging systems	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes
Cordless phones	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes
Combination Units	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes
Digital to Analog (DTA) converters	N/A ¹⁹	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
DVD products	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
External power adapters	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes
Home audio	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
Televisions	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes
VCRs	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes
Home Envelope											
Insulation products	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes

¹⁶ Geothermal Heat Pumps are not a typical choice for homeowners in the replacement market. In addition, GTHP application opportunities are constrained by land-area considerations.

¹⁷ Due to the unique nature of Geothermal Heat Pumps, with respect to consumer needs and installation constraints, this specification is different from the air source heat pump specification.

¹⁸ The savings depend on the consumer's behavior. EPA is launching an educational campaign in June 2008 to educate consumers on how to use programmable thermostats to get the savings. Depending on the success of the campaign, EPA may sunset this specification.

¹⁹ Digital to Analog (DTA) Converters were not on the market until 2008, in preparation for the Feb 2009 transition to digital TV signals.

Product Category	Product Available	Significant Issues with Consumer Realizing Expected Savings or Payback			Proven Technology		Cost-Effective		Maintain Performance	Technology Neutral	
	Broadly Available?	Proper Use Issues?	Installation Issues?	Systems/Design Issues?	Proven?	History of Issues?	Simple Payback	Regional climate Issues?	Performance Issues Identified	Different efficient technologies exist with similar functions?	Technology neutral specification?
Roof products	Yes	No	No	No	Yes	No	<4yrs	No	No	Yes	Yes
Windows, doors, and skylights	Yes	No	No	No	Yes	No	0-5 yrs	Yes ¹³	No	Yes	Yes
Lighting											
Compact fluorescent light bulbs	Yes	No	No	No	Yes	Yes ²⁰	~1 year	No	Yes ¹⁹	No ¹²	No
Decorative light strings	Yes	No	No	No	Yes	Yes ²¹		No	No	Yes	Yes
RLFs	Yes	No	No	No	Yes	Yes ²²	<2yrs	No	Yes ²¹	Yes	Yes
Office Equipment											
Computers/Monitors	Yes	No	No	Yes ²³	Yes	No	0yrs	No	No	Yes	Yes
Imaging Equipment	Yes	No	No	No	Yes	No	0yrs	No	No	Yes	Yes
Commercial Food Service											
Commercial dishwashers	Yes	No	No	No	Yes	No		No	No	No ¹²	Yes
Commercial fryers	Yes	No	No	No	Yes	No	1yr	No	No	No ¹²	Yes
Commercial hot food holding cabinets	Yes	No	No	No	Yes	No	2 yrs	No	No	No ¹²	Yes
Commercial ice makers	Yes	No	No	No	Yes	No		No	No	No ¹²	Yes

²⁰ Performance issues were identified through product testing. In 2008, DOE finalized a revised CFL specification that requires CFL partner participation in a third-party testing and verification program. See Section III.

²¹ Performance issues have been addressed through enhanced performance requirements in the specifications.

²² Performance issues were identified through product testing. They are being addressed through our Quality Assurance Program. See Section III.

²³ Substantial progress has been made working with industry to address network issues associated with power management. In 2008, EPA began promoting power management through the Low Carbon IT initiative.

Product Category	Product Available	Significant Issues with Consumer Realizing Expected Savings or Payback			Proven Technology		Cost-Effective		Maintain Performance	Technology Neutral	
	Broadly Available?	Proper Use Issues?	Installation Issues?	Systems/Design Issues?	Proven?	History of Issues?	Simple Payback	Regional climate Issues?	Performance Issues Identified	Different efficient technologies exist with similar functions?	Technology neutral specification?
Commercial solid door refrigerators and freezers	Yes	No	No	No	Yes	No	2yrs	No	No	No ¹²	Yes
Commercial steam cookers	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes
Other											
Vending machines	Yes	No	No	No	Yes	No	<1yr	No	No	No ¹²	Yes
Water coolers	Yes	No	No	No	Yes	No	0yrs	No	No	No ¹²	Yes

B. Revising product specifications and adding new product categories

As described above, EPA and DOE revise product criteria to address changes in the marketplace and enhance product energy performance. In addition, EPA and DOE also add new products to the ENERGY STAR suite to address new energy savings opportunities of national significance. Since the program's inception in 1992, more than 50 product and service categories have been added to the ENERGY STAR suite. In addition, EPA and DOE are currently reviewing existing and new products for specification revision or development. Table 10 shows the history of ENERGY STAR criteria development and specification revisions since the program's inception and indicates where revisions are under consideration. Table 11 shows new products for which EPA and DOE are currently in the process of drafting ENERGY STAR specifications.

In addition to the guiding principles outlined above, EPA and DOE have undertaken revising specifications to respond to concerns industry has raised regarding product quality (as in the case of CFLs) and energy performance testing procedures (as in the case of dishwashers).

As new and revised specifications come into effect or are suspended or sunset from the ENERGY STAR program, EPA and DOE follow general procedures to inform industry and ensure that products that no longer qualify for the label are phased out of supply channels by a specified period of time:

- Draft decisions regarding modification or suspension of specifications are sent to all manufacturing partners and other interested stakeholders indicating proposed effective dates for new specifications or rescission of discontinued specifications. For specifications that are being suspended, interested stakeholders are given a period of four weeks to comment. For specification revisions, a "no grandfathering" clause is highlighted in the draft indicating that any product sold, manufactured, or identified by the manufacturing partner as ENERGY STAR must meet the current specification in effect at the time the product is manufactured.
- Final specifications are sent to all manufacturing partners and other interested stakeholders with a cover memorandum highlighting the following: "ENERGY STAR qualification is not automatically granted for the life of the product model. To carry the ENERGY STAR mark a product model must meet the version of the ENERGY STAR specification in effect on the model's date of manufacture."
- All documents related to specification revisions and rescissions including cover memoranda are posted on www.energystar.gov. Once a revised specification becomes effective, only those product models meeting the new specification are listed on the qualified product lists on www.energystar.gov. All others are removed. In addition, only information on the new specification is included on the product Web pages. Information on previous specifications is archived. Products that no longer qualify due to a specification rescission are similarly removed.
- Manufacturers that continue to mislabel non-qualified products or that fail to respond to letters from EPA will have their Partnership Agreements revoked (if they are partners) and are subject to legal action.

C. *Revising homes specifications*

To ensure market differentiation and to fulfill the ENERGY STAR brand promise of cost-effective energy efficiency and environmental performance, the specification for ENERGY STAR qualified homes has been revised three times since it was first launched in the fall of 1995. Table 12 shows the major revisions to the specification.

Table 10. History of ENERGY STAR Product Specification Development and Revision
(as of January 1, 2008)

Product Category	CURRENT SPECIFICATION				DISCUSSION Discussion of Recent and Anticipated Specification Revision Activities	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
APPLIANCES							
Clothes washers	May 1997	Jan 1, 2007	25%	30%** S	The new criteria, effective January 1, 2007, incorporates updated criteria for the minimum Modified Energy Factor (MEF) of 1.72 and a new maximum Water Factor (WF) of 8.0. Based on criteria released March 7, 2008, DOE will revise the ENERGY STAR criteria in a two phase revision. The first revision will be effective July 1, 2009 and the second will be effective January 1, 2011.	May 1997 Jan 2001 Jan 2004 Jan 2007 Jul 2009 (Phase 1) Jan 2011 (Phase 2)	
Dehumidifiers	Jan 2001	Oct 1, 2007	55%	15%	Extended Industry Standard Architecture (EISA) establishes ENERGY STAR Tier 3 as a standard effective October 1, 2012.	Jan 2001 Oct 2006 Oct 2007 (Tier 2) Jun 2008 (Tier 3)	
Dishwashers	Jun 1996	Jan 1, 2007	60%	20%**S	The new specification, effective January 1, 2007 incorporated updated criteria for the minimum Energy Factor (EF) for standard-size and compact models. EPACK 2005 requires another revision to be final by the end of 2009, with an effective date in 2010.	Jun 1996 Jan 2001 Jan 2007	Yes

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
Refrigerators and freezers	Jun 1996	Apr 28, 2008	35%***	15% S	The new specification, effective April 28, 2008, requires standard refrigerators to be 20% more efficient than the Federal standard.	Jun 1996 Jan 2001 Jan 2003 (added freezers and compacts) Jan 2004 Apr 2008	
Room air conditioners	Oct 1996	Nov 16, 2005	40%	10% S	In October 2005, the ENERGY STAR criteria were expanded to include all categories of room air conditioners.	Oct 1996 Oct 2000 Oct 2003 Nov 2005	
Room air cleaners	Jul 2004	Jul 1, 2004	15%	45%	No changes scheduled at this time.	Jul 2004	
HEATING AND COOLING							
Boilers	Jun 1996	Apr 1, 2002	50% (Gas) 70% (Oil)	5% S	April 2002 version expanded definition of boiler to include combination space heating and water heating appliances.	Jun 1996 Apr 2002	
Ceiling fans	Jan 2002	Sep 1, 2006	35% (ceiling fans only) 1% (ceiling fans with lighting) 1% (ceiling fan light kits)	45%	In 2006, EPA revised the specification to make it easier for ceiling fan partners to identify those requirements that apply specifically to light kits by adding an Appendix A. All other elements of the specification remain unchanged.	Aug 2001 (Tier 1) Oct 2003 (Tier 2) Sep 2006	

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
Air source heat pumps Central air conditioners	Apr 1995	Apr 1, 2006	22% (air source heat pumps) 18% (central air conditioners)	10% S (air source heat pumps) 15% S (central air conditioners)	In 2004, EPA revised the central air conditioner/air source heat pump specification in response to the new federal minimum standards which match the ENERGY STAR 13 SEER requirement (new minimum standards became effective January 1, 2006). Tier 1, effective April 1, 2006, requires 14 SEER to qualify. In January 2009, this SEER level will increase to 14.5 for split systems. Both Tiers 1 and 2 also include EER requirements.	Apr 1995 Oct 2002 Apr 2006 Jan 2009 (Tier 2)	
Furnaces	Apr 1995	Oct 27, 2006	35% (Gas) 6% (Oil)	15% S	Effective October 27, 2006, EPA revised the ENERGY STAR furnace specification to require a more appropriate annual fuel utilization efficiency (AFUE) level for oil furnaces that takes into account the technical challenges of oil technologies and product availability, particularly in the Northeastern United States. EPA discussed feasibility of developing furnace fan requirements, but the discussions indicated a need to delay the inclusion of these requirements. EPA is, however, proposing a new Tier II AFUE requirement for gas furnaces of 92%, effective in 2009.	Apr 1995 Oct 2006 2009 (proposed Tier 2)	Yes
Geothermal heat pumps	Apr 1995	Apr 1, 2001	2%****	30% S	No changes planned at this time.	Apr 2001	

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
Light commercial HVAC	Jan 2002	Jan 1, 2004	30%	5% S	Under review in light of EPA Act standard going into effect in 2010.	Jan 2002 Jan 2004 (three-phase models)	Yes
Programmable thermostats	Apr 1995	Apr 1, 1995	35%	NA	Since 2002, EPA has been working with industry stakeholders to determine the best way to revise and implement a programmable thermostat specification such that energy savings are maximized and realized. Based on field studies of consumer behavior that were performed after this revision process began, EPA has since proposed a transition from a performance specification to a consumer education campaign. If a new performance specification cannot be finalized by March 2009, the existing specification will expire effective December 31, 2009.	Apr 1995 Feb 2008 Dec 2009 (proposed)	Yes
Ventilating fans	Jun 2001	Oct 1, 2003	13%	70%	Under review for potential revision to add additional test procedures.	Jun 2001 Oct 2003	Yes
HOME ELECTRONICS							
Battery charging systems	Jan 2006	Jan 1, 2006	.2% (Specification launched in 2006)	30%	The battery charging system specification was designed to complement the ENERGY STAR external power supply (EPS) specification. Together the two specifications cover virtually all portable electronic devices.	Jan 2006	Yes

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
					<p>This allows EPA to address the energy use of a variety of end use products without developing individual specifications for these products.</p> <p>EPA is currently monitoring efforts to develop a new performance-based test procedure for battery charger systems, which is anticipated to lead to a specification revision.</p>		
Cordless phones	Jan 2002	Nov 1, 2006	20%	55%	As a result of revisions to the ENERGY STAR specification for external power supplies, new performance requirements for all cordless phones will be effective November 1, 2008.	Jan 2002 Jan 2004 Nov 2006 Nov 2008	
Combination units	Jan 1998	Jul 1, 2005	10%	40%	The Combination Units under this spec are DVD/VCRs, TV/DVDs, and TV/VCRs. Beginning Nov 2008, DVD/VCRs will be covered under the DVD spec. TV/DVDs and TV/VCRs will be covered under the TV spec.	Jan 1998 Jul 2002 Jul 2004 (Tier 2) Jul 2005 (Tier 3) Sep 2003 Nov 2008	
Digital to analog (DTA) converters	Jan 2007	Jan 31, 2007	NA	50%	Digital to analog (DTA) converter boxes must incorporate an auto-power down feature to automatically switch from the On mode to Sleep mode without user input. The DTA category does not include converters that	Jan 2007	

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
					work with satellite or cable digital signals, nor does it cover devices with multi-functionality, such as a DVD player with a digital to analog conversion capability. The U.S. will shift to digital-only TV broadcasts in February 2009.		
DVD products	Jan 1999	Jan 1, 2003	9%	40%	Under review for potential revision.	Jan 1999 Jan 2003	Yes
External power adapters	Jan 2005	Jan 1, 2005	30%	35%	In April 2008, EPA finalized Tier 2 for external power supplies with more stringent no-load and active levels. Tier 2 is effective November 1, 2008. The Energy Independence and Security Act of 2007 established the current (Tier 1) ENERGY STAR specification as the federal standard, effective July 1, 2008.	Jan 2005 Nov 2008 (Tier 2)	
Home audio	Jan 1999	Jan 1, 2003	25-30%	35%	Under review for potential revision.	Jan 1999 Jan 2003	Yes
Set-top boxes	Jan 2001	NA	NA	NA	The ENERGY STAR set-top box (STB) specification was officially suspended as of May 31, 2005 due to the need for extensive research prior to setting new requirements. In 2007, EPA began developing a new ENERGY STAR specification for complex set top boxes, as well as a complementary	Jan 2001 May 2005 (suspended) Jan 1, 2009	

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
					partnership program for cable service providers. The specification and service provider partnership requirements were finalized in April 2008 and will be effective January 1, 2009.		
Televisions	Jan 1998	Jul 1, 2005	60%	20%	In November 2008, a new ENERGY STAR specification for TVs will be effective, which addresses both active and standby power.	Jan 1998 Jul 2002 Jul 2004 (Tier 2) Jul 2005 (Tier 3) Sep 2003 Nov 2008	
VCRs	Jan 1998	Jul 1, 2005	2%	55%	EPA has suspended the ENERGY STAR specification for VCRs in light of diminishing sales, effective November 1, 2008.	Jan 1998 Jul 2002 Jul 2004 (Tier 2) Jul 2005 (Tier 3) Nov 2008	

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
HOME ENVELOPE							
Insulation products	1995	2002	NA	NA	In 2002, EPA updated the insulation specification (Version. 2.0), insulation products logo, and incorporated promotion of insulation into the Home Sealing marketing platform to promote home envelope improvement.	1995 2002	
Roof products	Feb 1999	Dec 31, 2007	10% Residential 25% Commercial	NA	Due to absence of conclusive data, EPA determined that establishing an emissivity requirement for a national program is not yet feasible and elected not to pursue it as part of the recent revision. Manufacturers are required to report emissivity data for posting on the ENERGY STAR Qualified Product list.	Feb 1999 Jun 2005 Dec 2007	
Windows, doors, and skylights	Mar 1998	Sep 19, 2005	55%^	NA	DOE is in preliminary discussions with industry and stakeholders to require all qualified windows to have the Insulated Glass (IG) Units certified against a third party (e.g., ANSI) standard. In addition, two potential new elements include separate criteria for doors that differentiate between opaque and glazed as well as an air leakage requirement. Changes are proposed to be effective in 2009.	May 1997 Aug 2003 Sep 2005 Apr 2009 (proposed)	Yes

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
LIGHTING							
Compact fluorescent lamps	Oct 1999	Jan 1, 2004	20%	75%	Version 4.0, effective December 2, 2008, increases efficacy of lamps; creates specialty categories to encourage manufacture of covered, dimming and multi-way lamps; specifies CCT color ranges and chromaticity tolerances; specifies CRI requirements and tolerances; limits outliers on lumen maintenance requirements; requires Elevated Temperature Testing of reflector products applicable to indoor use/recessed cans; and initiates Third Party Testing and Verification Program financed by manufacturers.	Oct 1999 Oct 2001 Jan 2004 Dec 2008	
Decorative light strings	Aug 2007	Mar 1, 2008	NA	70%	In 2007, EPA with the help of Natural Resources Canada (NRCan), set criteria for decorative light strings based on electrical, lifetime, and weathering requirements.	Aug 2007 Mar 2008	
Exit signs	Sep 1996	Aug 1, 2004	35%	NA S	EPAct 2005 adopted ENERGY STAR requirements for exit signs. As a result, EPA suspended the ENERGY STAR exit sign specification effective May 2008.	Sep 1996 Jan 1999 Aug 2004 May 2008	

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
RLFs	Jun 1997	Oct 1, 2005	5%	75%	Version 4.1 adds testing and performance requirements for self-ballasted GU24 based lamps. To allow sufficient time for fixture manufacturers to transition to GU24 based lamps which have passed the Accelerated, Cycling, Thermal, and Voltage stress test, new GU24 requirements under version 4.1 are mandatory as of August 1, 2008.	Jun 1997 Jul 2001 Apr 2002 Sep 2003 Oct 2005 Aug 2008	
Traffic Signals	Sep 2000	NA	NA	NA S	EPA Act 2005 adopted ENERGY STAR requirements for traffic signals. As a result, EPA suspended the ENERGY STAR traffic signal specification effective May 2007	Sep 2000 Feb 2003 May 2007 (Suspended)	
OFFICE EQUIPMENT							
Computers	Jun 1992	Jul 20, 2007	NA	25%	Version 5.0, scheduled to go into effect July 2009, will make use of a single benchmark metric that will provide increased design flexibility for energy efficiency while maintaining product capability and allowing the ENERGY STAR specification to maintain relevance in the dynamic IT market.	Jun 1992 Oct 1995 Jul 1999 Jul 2000 Jul 2007 Jul 2009	Yes
Monitors	Jun 1992	Jan 1, 2006	50% (LCDs)	35%	EPA is currently reviewing the monitor specification for possible revisions effective in 2009.	Jun 1992 Oct 1995 Jan 1998 Jul 1999	Yes

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
						Jan 2005 Jan 2006 (Tier 2)	
Copiers	Jul 1995	Apr 2007	50%	20%	In 2007, EPA revised and consolidated the four separate imaging equipment specifications into a single specification addressing total energy consumption (TEC). EPA is currently working to establish Tier 2 levels, which will go into effect in July 2009.	Jul 1995 Jul 1997 Jul 1999 Apr 2007 Jul 2009 (proposed)	Yes
Digital Duplicators	Apr 2007	Apr 1, 2007	NA	NA		Apr 2007 Jul 2009 (proposed)	Yes
Multi-Function Devices	Apr 1997	Apr 1, 2007	50%	25%		Apr 1997 Apr 1999 Apr 2007 Jul 2009 (proposed)	Yes

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
Printers, fax machines, and mailing machines	Jan 1993 (printers)	Apr 1, 2007	50%	15% printer	In 2007, EPA revised and consolidated the four separate imaging equipment specifications into a single specification addressing total energy consumption (TEC). EPA is currently working to establish Tier 2 levels, which will go into effect in July 2009.	Jan 1993 (printers)	Yes
	Jul 1995 (fax machines)		40% Fax	Oct 1995 (printers and combination printer/ fax)			
	Nov 2000 (mailing machines)			NA Mail Machine		Nov 2000 (mailing machines)	
Scanners	Apr 1997	Apr 1, 2007	50%	10%		Nov 2000 Nov 2001 (Tier 2) Apr 2007 Jul 2009 (proposed)	
						Apr 1997 Apr 2007 Jul 2009 (proposed)	Yes
COMMERCIAL FOOD SERVICE							
Commercial dishwashers	Oct 2007	Oct 11, 2007	NA	25%	High and low under-counter temp, single tank door type, single tank conveyor, and multiple tank conveyor machines are all eligible for the	Oct 2007	

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
					ENERGY STAR. Qualified models must meet maximum gallons per rack requirements during the final rinse and use less energy while idling between wash cycles.		
Commercial fryers	Aug 2003	Aug 15, 2003	12%	20%	No changes planned at this time.	Aug 2003	
Commercial hot food holding cabinets	Aug 2003	Aug 15, 2003	18%	65%	No changes planned at this time.	Aug 2003	
Commercial ice makers	Jan 2008	Jan 1, 2008	NA	15%	EPA is considering adding flake and nugget machines to the specification in 2009.	Jan 2008	Yes
Commercial solid door refrigerators and freezers	Sep 2001	Sep 1, 2001	40%	35%	Specification covers commercial solid door refrigerators, freezers, combination refrigerator/freezers, and ice-cream freezers. EPA is considering revisiting the specification to expand to models used in laboratory applications, such as medical and biotechnology applications. Current performance levels will also be revisited in response to new DOE minimum standards that adopt ENERGY STAR levels, effective January 1, 2010.	Sep 2001 May 2009 (proposed)	Yes
Commercial steam cookers	Aug 2003	Aug 1, 2003	15%	50%	No revisions planned at this time.		

Product Category	CURRENT SPECIFICATION				DISCUSSION	SPECIFICATION HISTORY	
	Effective Date of Original Specification	Effective Date of Current Specification	2007 Estimated Market Share* (% of Total Sales/ Shipments) of Qualified Products	Percent Savings Over Typical Product* (S indicates federal standard exists)		History of Revision Effective Date(s)	Under review for potential revision?
OTHER							
Transformers	Apr 1995	NA	NA	NA S	EPA 2005 adopted ENERGY STAR requirements for transformers. As a result, EPA suspended the ENERGY STAR transformer specification, effective May 2007.	Apr 1995 May 2007 (Suspended)	
Vending machines	Apr 2004	Apr 1, 2004 July 1, 2007	22%	40%	This ENERGY STAR specification initially applied only to newly manufactured machine models. However, given the large remanufactured machine market, EPA expanded the program to rebuilt machines.	Apr 2004 Jul 2007 (Tier 2) Aug 2006 (rebuilt machines) Jul 2007 (Tier 2)	
Water coolers	Sep 2000	May 19, 2004	45%	45%	EPA will revisit this product category in 2009 for possible revision to performance criteria.	Sep 2000 May 2004	Yes

* Source: Sanchez, M., C.A. Webber, R.E. Brown, and G.K. Homan. 2007. *Status Report: Savings Estimates for the ENERGY STAR Voluntary Labeling Program*. Lawrence Berkeley National Laboratory. (LBNL-56380 (2007)) and other supporting spreadsheets.

** Percent Savings is based on average non-ENERGY STAR model compared to average ENERGY STAR model because so many models are above the federal standard. This comparison is more accurate than comparing federal minimum standard vs. ENERGY STAR minimum standard.

*** Market penetration (MP) for refrigerators only; MP for freezers not provided in shipment data.

**** Percent of ENERGY STAR qualified geothermal heat pumps as a percent of U.S. total heat pump market. The percentage of ENERGY STAR qualified geothermal heat pumps as a percent of U.S. total geothermal heat pump market is 55%.

^ As reported in *Study of the U.S. Market for Windows*, AAMA/WDMA 2006.

Table 11. New Products Currently Being Evaluated for ENERGY STAR Label Eligibility

Product category	Agency lead	Discussion
Water heaters	DOE	Final criteria will be released on April 2008 with an effective date of January 1, 2009.
Packaged terminal air conditioners and heat pumps	DOE	Due to mandated changes to both the federal standard and the required coolant, the ENERGY STAR criteria for PTACs have been delayed. DOE will look into the possibility of developing criteria once the federal standard is announced to take effect the same day as the federal standard takes effect.
Solid-state Lighting Luminaires	DOE	Final criteria were released September 2007 with effective date of September 2008 for an initial set of lighting product categories.
Commercial Griddles	EPA	Commercial griddles will be added to the suite of commercial foodservice products. Initial research has shown that there are existing technologies available in the griddle market that offer significant energy savings.
Enterprise Servers	EPA	A new ENERGY STAR specification for enterprise servers is in development. Draft 1 of the computer server specification is complete and awaiting stakeholder review. Elements of server efficiency EPA is hoping to address include the wide range of products, power supply efficiency, and idle power. In addition there will be standard information reporting requirements, power and temperature measurement requirements, power management and virtualization requirements, and energy efficiency performance benchmarks.
Data Storage Devices	EPA	As a complement to its work on Enterprise Servers, EPA is considering a specification for Data Storage Devices.

Table 12. Revisions to Homes Specifications

Home Type	Specification	Effective Dates	Cumulative Energy Savings	Discussion
Pre – 2000 era				
Site built only	30 percent more efficient than 1993 Model Energy Code (MEC), verified by HERS rating score of ≥ 86	1995 – 1999	50 million kWh 4 million therms	Measurement protocols set in original 1995 HERS Guidelines (uses 1993 MEC as Reference Home)
2000 – 2005 era				
Site built	HERS rating score ≥ 86 or 15 percent better than state energy code, whichever is more stringent	2000 – 2005	2,440 million kWh 185 million therms	Measurement protocols set in 1999 NASEO (National Association of State Energy Officials) National Home Energy Rating Technical Guidelines adopted 9/19/1999 (uses 1993 MEC as Reference Home)
Mfg.	Same as above	2000 – 2005	70 million kWh 5 million therms	Same as above
Total		2000 – 2005	2,510 million kWh 190 million therms	
2006 – on				
Site built	HERS Index ≤ 80 in cold climates, ≤ 85 in hot climates, or built to the national BOP, or 15 percent better than state energy code, whichever is more stringent	2006 – on	2,765 million kWh 212 million therms	Measurement protocols set in 2006 Mortgage Industry National Home Energy Rating Standards (uses 2004 IECC as Reference Home) and thermal bypass checklist
Mfg.	Builder Option packages designed to achieve a 30 percent energy savings over governing codes for manufactured housing	2006 – on	105 million kWh 8 million therms	BOP protocols developed by EPA
Total			2870 million kWh 220 million therms	

Section VI. Ensuring compliance with other Partnership Agreement requirements

EPA and DOE have invested significantly in pursuing both the voluntary and required data submission provisions of some Partnership Agreements. Tracking the market share of ENERGY STAR qualified products helps inform future specification revisions and program progress in delivering energy savings and related greenhouse gas emission reductions. EPA and DOE monitor both manufacturer shipment data and retailer sales data.

A. Manufacturer shipment data

As detailed previously in Table 3, product manufacturers for some categories are required to annually provide unit shipment data, provide other market indicators to assist in determining the market penetration of ENERGY STAR qualified units by model or provide an equivalent measurement as agreed to in advance by EPA and the partner. Since 2002, EPA has collected data from partners on their annual shipments of ENERGY STAR qualified products to the United States. Shipment data was added as a requirement to Partnership Agreements for all EPA managed product categories that have been revised or developed since 2001. Currently, shipment data is required in 27 EPA product categories, up from 19 in 2004. In addition, DOE requires shipment data for manufacturers of CFLs and other ENERGY STAR qualified products.

Partners who do not comply with requirements to provide shipment data are sent reminders and warning letters notifying them that they will be suspended from the program if they do not comply with the requirement by a specified date. Once a partnership has been suspended, company partnership information and products submitted to EPA as ENERGY STAR qualified are removed from the ENERGY STAR Web site for a minimum of 3 months. If a partner submits data prior to the end of the 3-month suspension period, the partner can be reinstated. Those that do not comply with data requirements within the suspension period have their Partnership Agreements in the relevant product category terminated and must reapply for partnership and re-qualify all of their products to be reinstated.

In 2006, 678 companies were required to submit ENERGY STAR unit shipment data. By May 25, 2006, 573 had submitted data. The remaining 105 companies were notified that their Partnership Agreements were being suspended. By September 10, 2006, an additional 53 companies had submitted data. The remaining 52 companies were notified that their Partnership Agreements were being terminated for not complying with the ENERGY STAR Partnership requirement to submit unit shipment data. As shown below in Table 13, 92 percent of partners with mandatory requirements for market data submission were in compliance with this provision of the Partnership Agreement.

Table 13. Compliance with Manufacturer Product Shipment Data Requirement

Product Category		2004 Responses	2004 Total Required to Respond	2004 Response Rate (%)	2005 Responses	2005 Total Required to Respond	2005 Response Rate (%)	2006 Responses	2006 Total Required to Respond	2006 Response Rate (%)
Appliances	Clothes washers	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Dehumidifiers	13	13	100%	15	16	94%	15	15	100%
	Dishwashers	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Refrigerators and freezers	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Room air conditioners	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Room air cleaners	No specification		--	10	11	91%	12	12	100%
Heating and Cooling	Boilers	26	29	90%	21	26	81%	26	27	96%
	Ceiling fans	21	23	91%	25	25	100%	26	27	96%
	Central air conditioners and air source heat pumps*	Requirement temporarily suspended		--	14	17	82%	17	17	100%
	Furnaces	22	23	96%	23	24	96%	23	24	96%
	Geothermal heat pumps	9	9	100%	8	12	67%	8	8	100%
	Light commercial HVAC*	Requirement temporarily suspended	Not Reported	--	7	9	78%	9	9	100%
	Programmable thermostats	--	--	--	--	--	--	--	--	--
	Ventilating fans	9	9	100%	10	10	100%	13	13	100%
Home Electronics	Battery charging systems	No Specification	--	--	No Specification	--	--		4	100%
	Cordless phones	3	5	60%	3	4	75%	3	3	100%
	Combination units	--	--	--	--	--	--			--
	External power adapters	No specification		--	14	14	100%	31	42	74%
	Home audio/DVD products	11	18	61%	9	9	100%	4 8	10	80%
	TVs/VCRs	20	26	77%	17	18	94%	18	18	100%
Home Envelope	Insulation and air sealing (home sealing)	--	--	--	--	--	--			--
	Roof products	169	185	91%	160	178	89%	163	173	94%
	Windows, doors, and skylights	NA	NA	NA	NA	NA	NA	NA	NA	NA

Product Category		2004 Responses	2004 Total Required to Respond	2004 Response Rate (%)	2005 Responses	2005 Total Required to Respond	2005 Response Rate (%)	2006 Responses	2006 Total Required to Respond	2006 Response Rate (%)
Lighting	Compact fluorescent lamps	54	90	60%	60	80	75%	NA	NA	NA
	Exit signs	39	43	91%	40	42	95%	48	52	92%
	RLFs	63	66	95%	71	76	93%	76	77	99%
	Traffic signals	7	9	78%	8	8	100%	5	9	56%
Office Equipment	Computers	--	--	--	--	--				--
	Copiers, Digital Duplicators	--	--	--	--	--				
	Monitors	--	--	--	35	41	85%	36	44	82%
	Multi-function devices	--	--	--	--	--				--
	Printers, fax machines, and mailing machines	--	--	--	--	--			--	--
	Scanners	--	--	--	--	--				--
Commercial Food Service	Commercial hot food holding cabinets	7	7	100%	8	8	100%	13	13	100%
	Commercial fryers	5	5	100%	5	5	100%	6	6	100%
	Commercial solid door refrigerators and freezers	14	16	88%	16	17	94%	19	19	100%
	Commercial steam cookers	7	7	100%	7	7	100%	5	5	100%
Other	Transformers	20	21	95%	25	26	96%	19	26	73%
	Vending machines	New product**		--	3	3	100%	3	3	100%
	Water coolers	10	12	83%	12	12	100%	12	12	100%
Total		529	616	86%	686	778	88%	626	678	92%

* Due to suspension of the EER requirement for the Residential CAC/ASHP from November 30, 2003 to August 4, 2005, EPA determined that it would have been difficult for the manufacturers to determine shipments of ENERGY STAR qualified units in 2004. Given the overlap between residential CAC/ASHP and light commercial HVAC models, EPA also suspended data requirements from manufacturers of light commercial products in 2004.

** Vending machines were introduced as a product category in 2004; as such a full year's worth of data was unavailable at this time.

"--" indicates shipment data not a requirement during that year.

B. Retailer sales data

Since 1998, ENERGY STAR has collected retail appliance sales data from participating national ENERGY STAR retail partners. The current ENERGY STAR retail program requirements specifically note that retailers of clothes washers, dishwashers, room air conditioners, and refrigerators are required to submit quarterly “sales data or other market indicators.” The data requested are:

- Type of product purchased
- Total inventory in units
- Number of ENERGY STAR qualified units sold, with the manufacturer model number
- Store location
- Date of sale

A number of national retailers submit appliance data for aggregation and publishing and have since 1997. However, no retailer submits sales data that meet all of the above requirements.

Several barriers impede the process of publishing quarterly ENERGY STAR qualified product sales data, including:

- Limited retailer resources
- Retail staffing changes
- Competitive and confidentiality concerns
- Product identification/tracking/reporting difficulties

Due to competitive and confidentiality concerns, a key condition of receiving data is that no data are submitted directly to ENERGY STAR but rather to private companies, which are not subject to Freedom of Information Act (FOIA) requests. The private companies work to ensure that no individual retailer sales can be identified from the aggregated sales data and does not identify individual participating retailers. Confidentiality is protected by aggregating data and ensuring that a minimum of three large retailers participate. This threshold is meant to 1) provide sufficient data for analysis and 2) protect against identification of sources of sales data.

It is important to note that the retail partner program requirements do not include submission of CFL data at this time. But, DOE and EPA are in the process of updating the sales data language for the ENERGY STAR retail/e-tail program requirements that will require the submission of quarterly sales data for additional qualified products, including CFLs and RLFs. In 2007, however, major retailers voluntarily began submitting data for residential lighting products.

Conclusion

The increasing introduction of new and enhanced energy-efficient technologies and products represents great success and brings new challenges for the ENERGY STAR program. The dynamic nature of the program demands that EPA and DOE continue to adapt program offerings, product specifications, and brand management to meet these challenges. The current monitoring activities and testing protocols help ensure that EPA and DOE are maintaining the value of ENERGY STAR today and for the future.