United States Environmental Protection Agency

ENERGY STAR®— THE POWER TO PROTECT THE ENVIRONMENT THROUGH ENERGY EFFICIENCY

INTRODUCTION

The ENERGY STAR® program has been a tremendous success in its first decade. Established by the U.S. Environmental Protection Agency (EPA) in 1992 for energy-efficient computers, the ENERGY STAR program has grown to encompass more than 35 product categories for the home and workplace, new homes, and superior energy management within organizations. Some highlights demonstrating the impact of this program are:[i]

- Thousands of organizations have partnered with the federal government to demonstrate a commitment to protecting the environment through energy efficiency.
- Americans have purchased more than 1 billion ENERGY STAR qualified products.
- More than 100,000 families live in new homes that have earned the ENERGY STAR.
- More than 40 percent of the American public recognizes the ENERGY STAR.
- Thousands of buildings have undergone effective energy improvement projects.
- More than 15,000 of the nation's buildings have been rated using EPA's national energy performance rating system.
- More than 1,100 buildings have earned the ENERGY STAR label for superior energy performance.

Further, because using energy more efficiently avoids emissions from power plants, avoids the need for new power plants, and reduces energy bills, sizable national benefits have accrued. In 2002, with the help of the ENERGY STAR program, Americans prevented greenhouse gas emissions equivalent to those from 14 million vehicles and avoided using the power that 50 300-megawatt (MW) power plants would have produced, while saving more than $7 billion.[ii]

With this success come questions about the future of the ENERGY STAR program, such as:

- What is necessary to build and maintain the ENERGY STAR program over the next decade?
- Have the most easily obtained benefits already been realized and will taxpayers receive a similar environmental and economic return on their investment over the next 10 years as they did in the first?

This paper explains how EPA will continue to expand the ENERGY STAR program, and it shows the expected growth in environmental and economic benefits. The overview—Why the ENERGY STAR Program Works—describes what EPA is striving to achieve with ENERGY STAR. Then for the major energy end-use sectors—residential, commercial, and industrial—the paper summarizes accomplishments to date and program elements that require further development. Finally, it outlines EPA's longer term goals for greenhouse gas reductions and energy bill savings for the nation, and shows that the ENERGY STAR program will continue to be a sound taxpayer investment over the next decade.

THE ENERGY STAR PROGRAM PROTECTS THE ENVIRONMENT BY PROVIDING COST-EFFECTIVE ENERGY EFFICIENCY SOLUTIONS TO BUSINESSES, ORGANIZATIONS, AND INDIVIDUALS.

ENERGY STAR

WHY THE ENERGY STAR PROGRAM WORKS

The ENERGY STAR program has dramatically increased the use of energy-efficient products and practices and is well positioned to promote more widespread efficiency improvements. Success is due, in part, to common market conditions surrounding energy efficiency. That is, there are many opportunities to save money by improving the efficiency of our homes, buildings, and industries using technologies and practices that already exist.[iii] However, homeowners, businesses and others do not take advantage of these opportunities because market barriers, such as lack of information and split incentives, limit their expenditures on what are, in fact, attractive financial investments when judged on the basis of complete information.

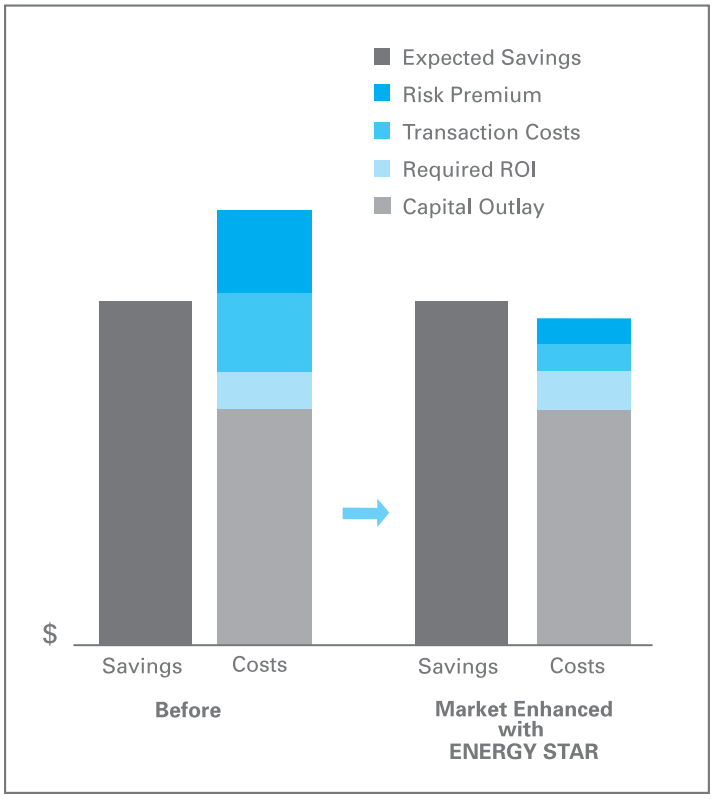
ENERGY STAR is designed to overcome many of the market barriers to the adoption of cost-effective energy efficiency products and services in a sustained manner and to help unleash the attendant savings for individuals and organizations. EPA's funding is not used to buy equipment, products, or services as is the case with some energy efficiency programs, such as traditional demand-side management (DSM) programs seeking near-term energy savings. Funding is used to provide businesses and consumers with information and tools that break down major market barriers and alter decisionmaking for the long term. This approach, which helps direct private capital toward energy efficiency investments, provides a large environmental and economic payback for the government investment.

One way to look at the role of ENERGY STAR is to examine the costs and risks involved in purchasing energy-efficient equipment or investing in an energy efficiency project. Beyond the actual capital outlay to purchase a product or technology and a required return on the investment (ROI) dollars, there may also be:

- Transaction costs for researching product or project choices.
- Risk premiums in case the product or project does not perform as claimed.

ENERGY STAR enhances the market for energy efficiency by reducing the transaction costs and lowering the investment risks to the point that many more projects become attractive (see Figure 1). It plays a distinct role in the market place by providing credible, objective information upon which businesses and homeowners can make better informed decisions.

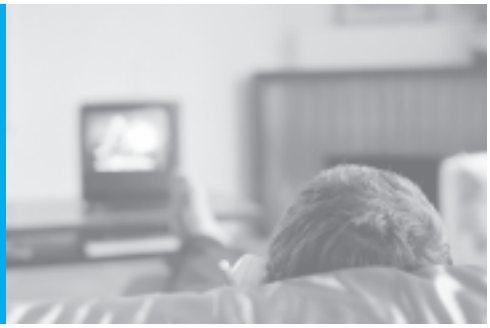
FIGURE 1.
ILLUSTRATION OF PROJECT COSTS BEING REDUCED BY ENERGY STAR INFORMATION



NOTE: This example assumes that the energy-efficient technology delivers the exact same service as the standard technology.

Source: Adapted from a working paper by Katrin Ostertag, Transaction costs of raising energy efficiency *(May 1999), presented at the IEA International Workshop on Technologies to Reduce Greenhouse Gas Emissions: Engineering-Economic Analyses of Conserved Energy and Carbon. Washington, DC. 5-7 May 1999.*

IF HALF OF ALL U.S. HOUSEHOLDS REPLACED A STANDARD TV WITH AN ENERGY STAR MODEL, THE CHANGE WOULD BE LIKE SHUTTING DOWN A POWER PLANT.



RESIDENTIAL ENERGY EFFICIENCY

The residential sector offers sizable opportunities for protecting the environment through energy efficiency. Consisting of more than 100 million households, this sector contributes about 17 percent of the nation's greenhouse gas emissions[IV] (see Figure 2) and offers potential energy savings in the range of 25 to 30 percent compared with current consumption. These retrofit options include adding the appropriate amount of insulation or buying more efficient products such as refrigerators and light fixtures. However, this sector also presents a large challenge for improving energy efficiency. To capitalize on the possible savings, homeowners face numerous decisions. They receive information on energy efficiency options for the home from many sources, including manufacturers, utilities, retailers, and contractors. Frequently this information comes in pieces, is inconsistent, and leaves homeowners with more questions about the best option, such as:

- Which products (or homes) offer the energy savings claimed by the manufacturer, product vendor, or home builder?
- Which products of those that cost more up front offer a reasonable return on the additional cost?
- Which products offer the desired features and performance in addition to greater energy efficiency (i.e., is a sacrifice required)?
- What design and installation issues are important to obtaining the claimed energy performance of a product?
- How do owners address the growing energy needs of the smaller electrical products and equipment in the household?
- How do owners find a heating and cooling contractor or home improvement professional who is well versed in the best practices for home energy efficiency?

EPA offers ENERGY STAR to homeowners as a straightforward, powerful, and reliable resource for answering many of these questions and showing the benefits of energy-efficient choices. The ENERGY STAR label is designed to clearly identify products, practices, and new homes that are energy efficient—meaning they lead to lower energy bills and help protect the environment while providing desired features and performance. The clear government backing of the label allows consumers to rely on it as credible and unbiased.

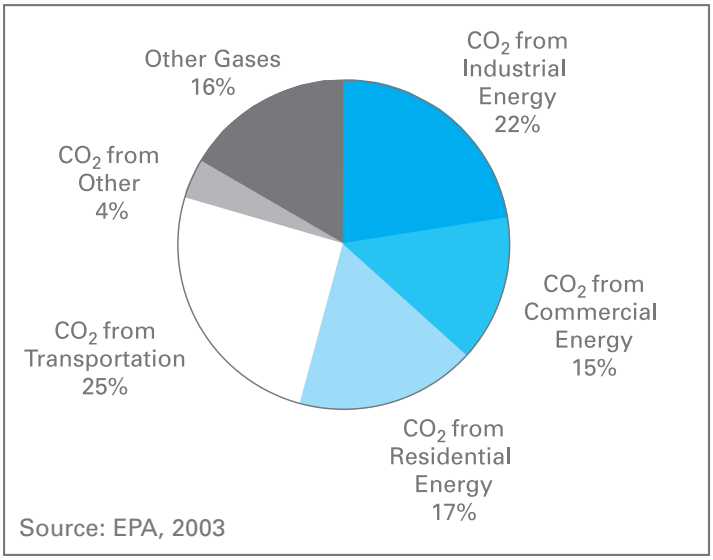
ENERGY STAR has had major accomplishments bringing greater energy efficiency to the residential sector; however, much more needs to be done. Accomplishments and key next steps are summarized below.

Clearly Indicating Which Products are Energy Efficient

A cornerstone of the ENERGY STAR program is identifying efficient products that will reliably deliver energy savings and environmental benefits. EPA and the U.S. Department of Energy (DOE)[V] work closely with more than one thousand manufacturers to determine the energy performance levels that must be met for a product to earn the ENERGY STAR. The Agencies only award the label in product categories where the efficient products offer the features **and** performance consumers want and provide a reasonable payback if the initial purchase price is higher.

- Currently, the ENERGY STAR label can be found on products in more than 35 product categories (see Table 1). The qualifying products offer a homeowner considerable savings: a home fully equipped with ENERGY STAR qualifying products will operate on about 30 percent less energy than a house equipped with standard products, saving the typical homeowner about $400 each year (see Table 2).

FIGURE 2.
U.S. GREENHOUSE GAS EMISSIONS



Source: EPA, 2003

- For many ENERGY STAR qualifying products, there is no additional cost at the time of purchase. ENERGY STAR has played an important role in the efficiency of products such as office equipment and home electronics because much of their energy use occurs when they are in standby mode. This is not apparent to the user. Through ENERGY STAR, the energy needs during standby have been greatly reduced with no change in product performance (see Table 1). To date these products have contributed impressive energy savings and environmental benefits.
- For other ENERGY STAR qualifying products such as kitchen appliances and heating and cooling equipment, the additional first cost may be significant. ENERGY STAR has played a pivotal role here, as well, by showing consumers that the higher initial cost of these products can be justified by the energy savings every month, year in and year out. ENERGY STAR provides a clear definition of what is energy efficient for many stakeholders across the country (utilities, state energy offices, etc.) who are implementing their own efficiency programs.
- Although many of the energy-using products in a household are now available with the ENERGY STAR label, additional products are always under consideration. In particular, EPA is examining other products that use energy in standby mode. These products, along with small household appliances, are expected to consume about 40 percent of home energy by 2015 if no improvements are made.[VI]

Providing Easy Access to Consumer Information

Through a government ENERGY STAR Web site and hotline, EPA and DOE provide information directly to interested consumers about the products that qualify for the ENERGY STAR. This information encompasses more than 18,000 individual product models across more than 1,250 manufacturers. It includes savings that can be expected, stores that carry the products, and environmental benefits that will result from using the products. This comprehensive Web site provides one place consumers can rely on to determine the authenticity of key information, see the list of products that qualify for the ENERGY STAR, and find additional home improvement tools and guidance. It is currently servicing more than one million visits per year.

Educating the Public

For the ENERGY STAR label to be attractive to homeowners (as well as businesses), they must not only recognize the label, but also understand that it represents cost savings and environmental protection. EPA undertakes a variety of efforts to (1) educate the public about the link between energy use and air emissions, (2) raise awareness of how products and services carrying the government-backed ENERGY STAR can protect the environment while saving them money, and (3) educate consumers about the hidden price tag of a product—the cost of energy to operate that product over its lifetime.

ABOUT 40% OF THE AMERICAN PUBLIC CURRENTLY RECOGNIZES THE ENERGY STAR LABEL.

TABLE 1.
OVERVIEW OF PRODUCTS IN THE ENERGY STAR PROGRAM

Product Groupings (# of product categories)	Lead Agency	Energy Savings Above Standard New Products	Market Penetration of ENERGY STAR Qualifying Products Sold in 2000	Other Highlights
Office Equipment (8)				
Computer/Monitor at Home	EPA	27%	95%/97%	• Specifications for monitors and imaging equipment are under revision in 2003.
Computer/Monitor at Work	EPA	52%	95%/97%	
Copier	EPA	42%	90%	
Fax	EPA	40%	99%	
Other	EPA	26–49%	range	
Home Electronics (8)				
Televisions	EPA	24%	46%	• Audio equipment needs to use less than 1 watt in standby to earn the ENERGY STAR effective January 2003.
VCRs	EPA	29%	94%	
TV/VCRs	EPA	30%	76%	
Audio	EPA	69%	31%	• Products in other categories (e.g., TVs, VCRs) are expected to meet 1 watt levels by 2005.
Other	EPA	4–17%	range	
Heating/Cooling (7)				
Central Air Conditioners	EPA	24%	20%	• Specifications for programmable thermostats are being examined to help improve usability for the consumer.
Furnaces (Gas)	EPA	15%	27%	
Programmable Thermostats	EPA	20%	36%	
Other	EPA	7–30%	range	
Appliances (6)				
Clothes Washers	DOE	38%	10%	• Current specifications are effective as of the effective dates of most recent minimum efficiency standards.
Dishwashers	DOE	25%	20%	
Refrigerators	DOE	10%	17%	
Room Air Conditioners	DOE	10%	13%	
Other	EPA	10–43%	range	
Lighting (3)				
Fixtures	EPA	66%	3–5%	• Specifications are being revised as additional testing methods are developed to address performance criteria.
Bulbs	DOE	66%	3%	
Exit Signs	EPA	75%	73%	
Building Envelope (3)				
Windows	DOE	range	range	• Specifications for windows were recently revised.
Other	EPA	range	range	
Other (5)	EPA	range	range	

Educating the Public *(continued)*

- About 40 percent of the American public currently recognizes the ENERGY STAR label. In regions that have active energy efficiency programs, this recognition is at 60 percent or more. About half of those who have made a recent ENERGY STAR purchase report that they were influenced by the label.[VII]
- EPA is working toward the goal of having 60 percent of the American public recognize the label. Based on the effort required to attain this level of recognition, EPA will develop additional goals for the latter part of the decade.
- EPA is also striving to increase public awareness of ENERGY STAR as a government-backed program providing credible, unbiased information. Recent reports suggest that some consumers are confused about who is behind the ENERGY STAR, with some believing it is a private sector eco-label, a perception EPA must correct to continue building consumer confidence.[VIII]

Providing Energy Efficiency Information When and Where Decisions are Made

In addition to product manufacturers, EPA and DOE collaborate with a number of organizations to get clear, accurate ENERGY STAR information to consumers. These organizations include retailers, utilities, state energy groups, and public benefits funds administrators. EPA provides them with training and template materials to use in their own energy efficiency programs and outreach efforts. This support is particularly useful to those groups administering public dollars because it allows them to use their own funds to reach the businesses and individuals in their regions, not spend them on the creation of a regional infrastructure for energy efficiency. EPA expects to broaden these partnerships over the next several years because these organizations frequently have direct contact with consumers and are well positioned to provide consumer information on home energy efficiency at the time of purchase.

Protecting the Integrity of the ENERGY STAR Label

Maintaining the integrity of the ENERGY STAR label is essential to building awareness of and maintaining consumer confidence in the label, as well as protecting the taxpayer investment in the program over the past 10 years.

- EPA routinely monitors the use of the label on products in the market place to ensure that it is used to identify only products that qualify.
- EPA selectively tests products to ensure that products said to qualify for the label do indeed qualify.
- EPA updates the performance specifications for the ENERGY STAR as market conditions change so that the ENERGY STAR continues to identify the most efficient, cost-effective products on the market. EPA is currently updating the ENERGY STAR specifications for monitors, imaging equipment, and programmable thermostats, while DOE recently updated the residential window specification (see Table 1).

Improving New Home Construction

EPA has provided an energy efficiency platform for builders of new homes since 1995, assisting them with information on how to construct homes that are 30 percent more efficient than homes built to the Model Energy Code. Builders can promote ENERGY STAR qualified homes as energy efficient, comfortable, and affordable.

- More than 2,000 active home builders partner with EPA in the ENERGY STAR program.
- The market penetration for ENERGY STAR has reached more than 20 percent in several markets. EPA has focused on the rapidly expanding new housing markets in California, Texas, Phoenix, and Las Vegas. New Jersey, New England, and the Midwest also have high concentrations of ENERGY STAR builder partners.

THOUSANDS OF BUILDERS HAVE CHOSEN TO QUALIFY THEIR HOMES AS ENERGY STAR.

TABLE 2.

TYPICAL ANNUAL HOME ENERGY BILL SAVINGS FROM ENERGY STAR QUALIFIED EQUIPMENT VERSUS STANDARD NEW EQUIPMENT – for Homes with Varying Heating and Cooling Equipment (in 2000 dollars)

Product Category	Home with Gas Furnace and Central Air Conditioner	Home with Gas Furnace and Room Air Conditioners	Home with Gas Furnace and Air Source Heat Pump
Office Equipment			
Computer and Monitor	$10	$10	$10
Fax	$10	$10	$10
Laser Printer	$20	$20	$20
Home Electronics			
TV	$3	$3	$3
DVD	$3	$3	$3
Heating and Cooling			
Heating	$108	$108	$130
Air Conditioning	$75	$15	
Programmable Thermostat	$100	$72	$100
Lighting			
5 most used fixtures	$60	$60	$60
Appliances			
Dishwasher	$8	$8	$8
Clothes Washer	$41	$41	$41
Refrigerator	$4	$4	$4
Indirect (Other) Savings			
Water Heating Energy Savings	$16	$16	$16
Clothes Dryer Electricity Savings	$7	$7	$7
Other Fuel Savings	$18	$18	$18
Total Savings	**$465**	**$377**	**$412** **Avg. $418**

NOTES:
Table compares ENERGY STAR with standard new equipment; additional savings are realized when compared to stock.
Heating and cooling savings numbers assume equipment working together.
Room air conditioning number assumes 3 units in the house.
The 5 most used lighting fixtures: kitchen, living room table, living room floor, outdoor wall, and bathroom wall.

Improving New Home Construction *(continued)*

- One-third of the top 100 builders are ENERGY STAR partners. And the Army Corps of Engineers now builds all new Army homes as ENERGY STAR.
- EPA has found ways to reduce builder costs when testing homes for the stringent ENERGY STAR guidelines, providing homeowners with verification at low cost to the builder.
- EPA will continue to build consumer interest in energy-efficient homes with its current partners, as well as expand into additional regions of the country such as the Pacific Northwest. EPA will also work with the manufactured housing industry to ensure that more of these homes meet ENERGY STAR guidelines.
- EPA has set a goal of more than 500,000 ENERGY STAR qualifying homes by 2006.

Better Trained Home Contractors and Informed Home Owners

EPA supports the growing number of professionals trained to understand how parts of the home work together to maintain comfort while reducing energy costs.

- Through ENERGY STAR Home Sealing, contractors and homeowners are learning about the importance of sealing air openings to the outside while properly insulating walls and attics. When combined with ENERGY STAR qualified windows, this sealed home envelope keeps conditioned air within the living space, improving comfort and reducing energy bills.
- EPA actively supports the North American Technician Excellence (NATE), which tests HVAC contractors on proper installation, maintenance, and repair or service of heating and cooling equipment.
- EPA also partners with organizations around the country to offer a new home retrofit program called Home Performance with ENERGY STAR. In this program, trained professionals provide homeowners with detailed home energy audits and make key cost-effective recommendations to improve efficiency and comfort of the home. At the homeowner's request, they will also make the improvements. Work performed by home performance contractors is quality controlled by the sponsoring organization. EPA is expanding this program to more than 20 areas of the country over the next 3 years.

Affordable Housing

The only truly affordable home is an energy-efficient one, with a lower monthly energy bill that places a smaller burden on limited monthly resources. EPA supports the U.S. Department of Housing and Urban Development (HUD) in its integration of ENERGY STAR into home energy programs and other affordable housing efforts.

International Partners

EPA also cooperates with countries around the world that are interested in adopting the ENERGY STAR label. In 2001, EPA signed an international agreement with Natural Resources Canada, allowing it to implement an energy efficiency labeling program modeled after ENERGY STAR. This complements existing ENERGY STAR agreements with the European Community, Japan, Taiwan, Australia, and New Zealand.

MORE THAN 1,100 BUILDINGS ACROSS THE UNITED STATES HAVE EARNED THE PRESTIGIOUS ENERGY STAR.

COMMERCIAL AND INDUSTRIAL ENERGY EFFICIENCY

Increasing energy efficiency in the commercial and industrial sectors also offers sizable opportunities for cost savings while avoiding emissions of greenhouse gases. These sectors contribute about 37 percent of the nation's greenhouse gases, with buildings alone contributing 15 percent (see Figure 2).[IX] Again, a number of analyses suggest that substantial savings from cost-effective improvements are available across these sectors if certain market barriers can be overcome.[X, XI] These barriers include:

- **Lack of corporate commitment**. When questioned, many high-level financial decisionmakers see electricity as the least controllable category of business costs.
- **Lack of information**. Buildings and industrial facilities have complicated energy operations. While information is available on how to approach and undertake effective energy efficiency improvements, this information is not widespread. And the expertise for making changes is lacking within many organizations.
- **Lack of measurement tools**. People routinely accept the premise that you cannot manage what cannot be measured. Until 1999, there was no reliable measure for the energy performance or efficiency of various types of commercial buildings or industrial facilities. Nor was there a clear definition of what makes a building or facility efficient.
- **Tenant/landlord split incentives**. Frequently, utility bills for a commercial building are passed through to and paid by the tenants. In these cases, the building owner has little incentive to engage in energy efficiency efforts because the tenants directly benefit from the savings, not the owner.

EPA offers ENERGY STAR to businesses and other organizations as a straightforward way to adopt superior energy management and realize the cost savings and environmental benefits that can result. EPA promotes a strategy for superior energy management that starts with the top leadership, engages the appropriate employees throughout the organization, uses standardized measurement tools, and helps an organization prioritize and get the most from its efficiency investments.

While EPA has made significant progress promoting greater energy efficiency across these sectors, much more needs to be done. EPA is undertaking the following activities:

Encouraging Top-Level Commitment to Energy Efficiency

EPA offers the ENERGY STAR partnership to organizations of all types and sizes. As part of it, senior-level executives make a commitment to the superior energy management of their buildings or facilities. This top-level organizational commitment has proved to be the catalyst for energy efficiency investments in many of the most successful partner organizations.

- Almost 12,000 organizations have partnered with EPA in the pursuit of superior energy management (see Table 3). These partners include:
  - More than 425 public organizations such as state and local governments, schools, and universities.
  - More than 880 businesses across the commercial and industrial sectors.
  - More than 8,000 small businesses.
- ENERGY STAR partners represent over 9 billion square feet or 13.8 percent of the commercial building market as well as a significant number of industrial facilities (see Table 3).
- EPA will expand partnerships across the commercial and industrial sectors to catalyze energy efficiency at the top management levels and to facilitate the development of best practices and information sharing. While EPA will partner with any interested organization, special focus will be placed on those sectors for which EPA has been able to develop new standardized measurement tools. These sectors include commercial real estate, public buildings, schools (K-12), higher education, healthcare, hospitality, automobile manufacturing, cement manufacturing, wet corn milling, and others (see Table 3).

EPA'S PROVEN ENERGY MANAGEMENT STRATEGY

Guidelines for Superior Energy Management

EPA offers a superior energy management strategy based on the success of thousands of ENERGY STAR partners. Partnership with EPA turns energy management plans into actions:

- Top-level attention and a public commitment to secure resources for sustained improvements.
- A credible, objective energy performance rating system to assess the performance of buildings, validate savings, and recognize top performance.
- 5-stage building upgrade approach based on building science and designed to take advantage of building system interactions for greater savings and comfort.
- Visibility of an organization's achievements in the public and financial markets.
- Access to a network of partners, bringing creative approaches to problem solving.

Building the Financial Case

To engage top-level managers, they must see the link between effective energy management and their core objectives. EPA is working to demonstrate this connection and to provide organizations with new financial indices that help management understand how their energy costs affect their profitability relative to others in their sector.

- EPA has collaborated with Innovest, a financial analysis firm, whose studies have determined that companies with effective energy management plans in place tend to be strong environmental performers and strong performers on Wall Street. Innovest research shows that leaders in corporate energy management outperform their competitors by 20 to 30 percent on Wall Street.[XII]
- EPA has also succeeded in describing energy savings in terms of core business objectives for a wide range of business sectors. For example, EPA has demonstrated that:
  - A commercial building owner can generate $2 to $3 of incremental asset value for every $1 invested in energy performance improvements.
  - A retail grocery can reap the equivalent of increasing sales by $85 when it reduces annual energy costs by $1, given this sector's low profit margins and relatively high energy expenses.
  - A full service hotel can realize the equivalent of increasing its average daily rate by $1.35 (about 1.6 percent) from a 10-percent improvement in energy performance.
- EPA will continue to use a variety of outreach activities to convey the strong financial case for effective energy management.

Offering Guidelines for Superior Energy Management

Through its work with thousands of partners in Green Lights and now ENERGY STAR, EPA has identified the key elements of superior energy management. They are:

- ***Top-level commitment to reduce energy waste.*** Without this commitment, resources are often not allocated to energy projects, and efficiency programs are not sustained.
- ***Routine assessment of organization-wide performance, against competitors and across own portfolio.*** Assessing energy use in all operations and all buildings results in resources being targeted to those facilities with the greatest potential for improvement. Organizations can rank their own properties, learn from the high performers, and upgrade the poor performers.
- ***Use of a systems-integrated approach to upgrade buildings.*** Sizing heating and cooling equipment, integrating individual technical components, and controlling, operating, and maintaining equipment play a big role in the energy performance of a building.

Organizations using these guidelines have realized twice the energy savings for a given investment as alternative approaches. The case for these guidelines is clear given the findings from the past decade:

- The efficiency of building components such as windows, chillers, etc., has improved by more than 30 percent over the past 25 years, yet building energy use has not improved by nearly as much.[XIII]

Food Lion, LLC, Salisbury, North Carolina

Food Lion, LLC, a subsidiary of Brussels-based Delhaize Group, operates more than 1,200 supermarkets in 11 Southeastern and Mid-Atlantic states. Food Lion received the ENERGY STAR Award for Excellence in Energy Management in 2002 and 2003.

Tracking 10 cents of its earnings per share to its energy efficiency accomplishments, Food Lion has successfully integrated energy management into its corporate business objectives. Food Lion benchmarks all of the stores in its portfolio, evaluates the worst performing stores on a monthly basis, and provides quarterly energy bonuses to maintenance staff to encourage improvements. A key partner in developing the EPA benchmark for supermarkets, Food Lion has used the energy ratings to justify recommissioning services.

Food Lion's energy management measures have resulted in impressive energy savings. In 2001, even with a 6-percent increase in store square footage, Food Lion reduced energy consumption by 1.3 percent—equivalent to over $50 million in sales. In 2002, Food Lion saw energy savings of 5 percent, and annualized cost savings of nearly $15 million, despite increasing its net square footage by 2 percent. These savings are the equivalent of increasing sales by $465 million or eliminating the energy use of 55 stores.

- An examination of U.S. buildings shows that the best performing buildings use 75 percent less energy than the worst performing buildings. It also shows that this difference cannot be accounted for by particular technologies, climate, building size, or building age.[XIV]

EPA offers its proven energy management strategy to each of its 12,000 partners. EPA estimates that to date more than 47.5 billion kWh have been saved through these efforts.[XV] EPA will continue to promote this approach to its current partners and offer it to more businesses and organizations.

Providing New Standardized Measurement Tools

Fundamental to this whole-building systems approach is EPA's national energy performance rating system for buildings, unveiled in 1999. This rating system measures how well the building systems are integrated and how well the building is operated and maintained. It fills an important measurement gap because no consistent or comparable metric existed prior to this system. Now a building owner or manager has a rating akin to the miles per gallon rating for an automobile. And this rating can be used in key market transactions such as the assessment of a building's asset value or the lease price of building space.

- EPA has developed the online rating system for office buildings, schools (K-12), hotels, grocery stores, and hospitals (see Table 3). Numerous organizations have embraced it and evaluated more than 15,000 buildings through 2002. They represent 16 percent of the nation's office building market, 13 percent of schools, 20 percent of supermarkets, 21 percent of hospitals, and 5 percent of hotels.
- EPA has also seen major organizations adopt the national rating system as part of their energy management efforts. For example, many organizations are using energy performance ratings to help direct their project investments and monitor progress (see sidebars). Two large pension fund managers, TIAA-CREF and Lend Lease, have announced that they are requiring managers of the buildings in their portfolios to rate the energy performance of these buildings and work to improve their performance.[XVI]
- EPA expects to add court houses, residence halls, fast food establishments, and other retail building spaces to the rating system over the coming year. At that point, the rating system will apply to more than 50 percent of the building space across the country. EPA will also continue to promote the rating system to its partners and other organizations as an effective means of measuring building performance and setting future performance goals.
- EPA is now exploring how to adapt the rating to the industrial sector. A substantial portion of the industrial sector could benefit from improved energy performance measurement tools and enhanced corporate energy management. EPA is investigating industrial energy performance indicators at the facility level with interested sectors, including automobile assembly, malt beverage production, and corn refining. The glass manufacturing and pharmaceutical industries have also expressed interest. EPA will support the development of indicators for three to five sectors per year.

Starwood Hotels & Resorts Worldwide, Inc., White Plains, New York

Starwood Hotels & Resorts Worldwide, Inc., is a leading U.S. hotel company, owning, operating, and franchising over 700 hotels in 80 countries. Its brands include Four Points, Sheraton, Westin, and W Hotels. Starwood received the ENERGY STAR Award for Excellence in Energy Management in 2002 and 2003. And at the Energy Efficiency Forum at the National Press Club in June 2002, EPA recognized Starwood's Sheraton Boston Hotel as one of the first hotels in the nation to earn the ENERGY STAR.

Starwood's "Energy Management is Good Business" strategy is centered around its commitment to making energy management everyone's responsibility. The company has benchmarked all of its owned and managed hotels using EPA's energy performance rating system and will apply for the ENERGY STAR label for top performing hotels (those scoring 75 or better) to demonstrate its environmental commitment to guests and the public. Starwood based a portion of its 2001 bonuses for its energy team on energy consumption reductions, and its "Watts for Wheels" contest created competition among the company's properties for energy efficiency accomplishments. Starwood also helped EPA test the benchmarking system for hotels by providing energy data for all of its buildings.

Starwood's energy management initiatives are paying off. The company invested $8.5 million in energy projects completed in 2001, and saved $3.4 million—equivalent to renting 9,370 additional rooms. In 2002, Starwood invested approximately $4.6 million in energy projects and saved $1.3 million, the equivalent to renting 9,800 additional rooms.

Distinguishing the Top Performing Buildings

Based on results from the national energy performance rating system, EPA offers the ENERGY STAR label as a way to distinguish buildings that are top energy performers—those scoring in the top 25 percent of their class which also meet industry standards for indoor air quality.

- Hundreds of organizations have applied for the ENERGY STAR and by the end of 2002, 1,100 top performing buildings nationwide had earned the prestigious label.
- As a group the ENERGY STAR qualifying buildings use 40 percent less energy than the average building in the United States while providing quality space.
- EPA will continue to offer the ENERGY STAR label for top performing buildings and work with organizations to help them highlight the design, operations, and maintenance features that make the buildings qualify.
- EPA is collaborating with leaders in the Green Buildings Industry to ensure that similar approaches are used to recognize top energy performing buildings in the ENERGY STAR program as are used for green building certification.

Identifying Efficient Products for the Workplace

While ENERGY STAR for the commercial and industrial sectors places a large emphasis on whole-building system improvements, there are times when making the efficient choice is as easy as choosing the most efficient product. This is largely the case with products that plug into an outlet—plug loads. Many such products, including office equipment and appliances, already qualify as ENERGY STAR and offer significant energy savings within these sectors. EPA recommends that organizations specify the following products as part of their bulk procurement practices: office equipment, commercial refrigerators, water coolers, and unitary heating and cooling equipment. EPA may add commercial cooking equipment and vending machines to this list in the coming years.

Providing Recognition for Success

An important aspect of an effective energy management plan is setting goals for continuous improvement and then meeting these goals. Using the national energy rating system and other means, EPA recognizes organizations for reaching key milestones in improved energy performance and the environmental benefits these achievements deliver.

Working with Interested Organizations

In addition to the businesses seeking to improve their energy performance, EPA works with a number of organizations to get clear, accurate information to these energy end-users about opportunities for improved energy performance. These organizations include energy service providers, utilities, state energy groups, and public benefits funds administrators. EPA provides them with training and outreach materials to use in their own energy efficiency programs. This support is particularly useful to groups administering public dollars because it helps them use their own funds to reach businesses in their regions, instead of in the creation of a regional infrastructure for energy efficiency. EPA plans to continue to broaden these partnerships because it is these organizations that have frequent and direct contact with the end-user.

TABLE 3.

OVERVIEW OF BUILDING SECTORS AND POTENTIAL GREENHOUSE GAS REDUCTIONS FROM SUPERIOR ENERGY MANAGEMENT

Market Segment	Potential Carbon Savings (MMTCE)	Extent of Commitment to ENERGY STAR: Total Active Partner Square Footage (% of market)	Availability of Standardized Measurement System	EPA 2012 Carbon Savings Goals (MMTCE)
Office	17.5	3.9 billion (32%)		5.3
General			available since 1999	
Courthouses			available in 2003	
Banks			available in 2003	
Financial Centers			available in 2003	
Retail	14.3	1.9 billion (18%)		3.1
Drug Stores			available by 2004	
Discount Stores			available by 2004	
Home Centers			available by 2005	
Department Stores			available by 2005	
Education	7.4	1.0 billion (12%)		2.3
K-12			available since 2000	
Higher Education			residence halls available in 2003	
Healthcare	6.9	350 million (12%)		1.3
Acute Care Hospitals			available since 2001	
Medical Office Buildings			available in 2003	
Clinics			available by 2006	
Lodging	5.9	730 million (16%)	available since 2002	1.4
Food Service	4.9	6 million (1%)		1.2
Fast Food Restaurants			available in 2003	
Food Sales	3.0	377 million (37%)		1.3
Grocery Stores			available since 2001	
Convenience Stores			available by 2006	
Other	15.8	1.1 billion		1.6
Post Offices			available in 2003	
Warehouses			available in 2003	
Telecommunication Centers			available by 2004	
Wastewater Treatment Facilities			available by 2005	
Drinking Water Treatment Facilities			available by 2006	
TOTAL	**75.7**	**9.3 billion**		**17.5**

NOTE: Savings potential based on a 30% savings in total energy being possible.

FIGURE 3.
AVOIDED GREENHOUSE GAS EMISSIONS FROM THE ENERGY STAR PROGRAM: 1993 TO 2002

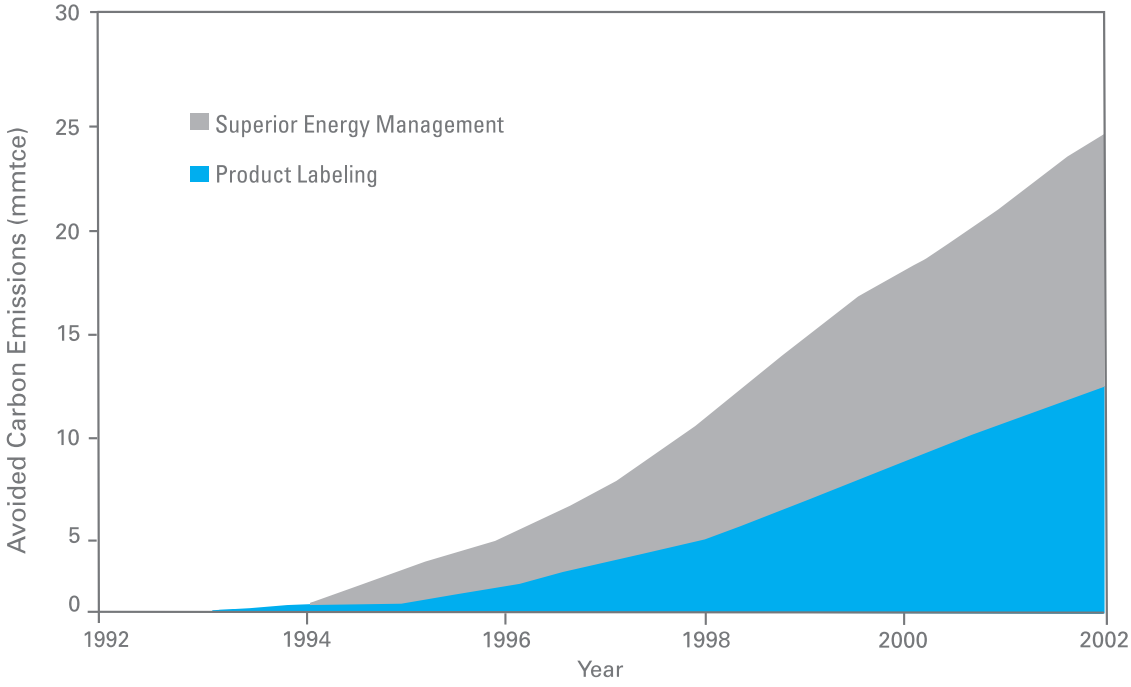
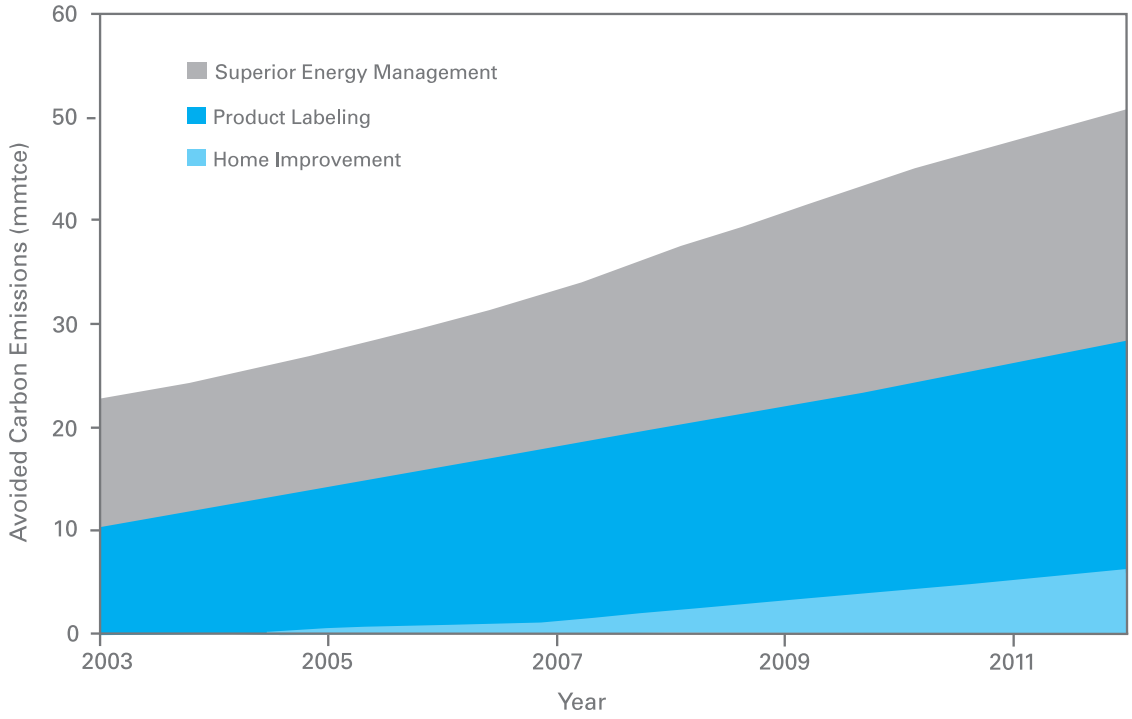


FIGURE 4.
EXPECTED EMISSIONS REDUCTIONS FROM THE ENERGY STAR PROGRAM: 2003 TO 2012



THE TYPICAL HOME CAUSES MORE GREENHOUSE GAS EMISSIONS THAN THE TYPICAL VEHICLE. WITH ENERGY STAR, PEOPLE CAN LOWER THESE EMISSIONS BY 30% WHILE SAVING MONEY.

FUTURE OF THE ENERGY STAR PROGRAM

Each year, EPA makes a significant effort to accurately estimate the environmental and economic benefits from the ENERGY STAR program. EPA uses peer-reviewed methods that capture the enhanced flow of efficient technologies and practices into the residential, commercial, and industrial sectors due to the ENERGY STAR program, while accounting for the business-as-usual improvements that would have occurred anyway.[XVII, XVIII]

In 2002, EPA estimates that Americans, with the help of the ENERGY STAR program:

- Saved more than 100 billion kWh of electricity.
- Prevented more than 20 MMTCE[XIX] of greenhouse gas emissions, the emissions equivalent to those from more than 14 million automobiles.
- Saved more than $7 billion.

Roughly half of these benefits are the result of people using ENERGY STAR qualifying products in their homes or at work, and the other half from organizations adopting superior energy management practices across the commercial and industrial sectors (see Figure 3).

Looking to the future, EPA expects the activities outlined above to expand the ENERGY STAR program and to grow the benefits steadily from 2002 to 2012, as shown in Figure 4. By 2012, the ENERGY STAR program is expected to avoid about 50 MMTCE of greenhouse gas emissions each year, equivalent to the emissions from more than 30 million vehicles, and reduce energy bills by about $15 billion annually.

In 2012, EPA expects the use of ENERGY STAR qualifying products at home and at work to contribute about 45 percent of the environmental and economic benefits and the adoption of superior energy management practices to contribute an additional 45 percent. The remaining 10 percent will come from widespread efforts to incorporate energy efficiency more comprehensively into home improvement.

The expected 2012 results represent a doubling in the benefits from the ENERGY STAR program during its second decade, proving that sizable benefits remain to be harvested from this approach for delivering energy efficiency to the country.

The keys for continued success over the next decade to which the EPA remains committed are:

- Maintaining the value of the ENERGY STAR label among the many partners using it to communicate characteristics of their products or their environmental stewardship actions.
- Providing clear, objective, and accurate information to consumers, businesses, and organizations about sound approaches for energy efficiency and environmental protection.
- Maintaining transparency with the business community as the ENERGY STAR program moves forward and energy efficiency specifications are updated and improved.

"Our partnership in ENERGY STAR reflects a fundamental commitment by Kodak to continuous improvement of all aspects of our energy performance. We will continue working to strengthen our commitment because it's good for our business, in addition to being the right thing to do for the environment."

—CHARLES S. BROWN, SENIOR VICE-PRESIDENT AND DIRECTOR, GLOBAL MANUFACTURING & LOGISTICS, EASTMAN KODAK COMPANY

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