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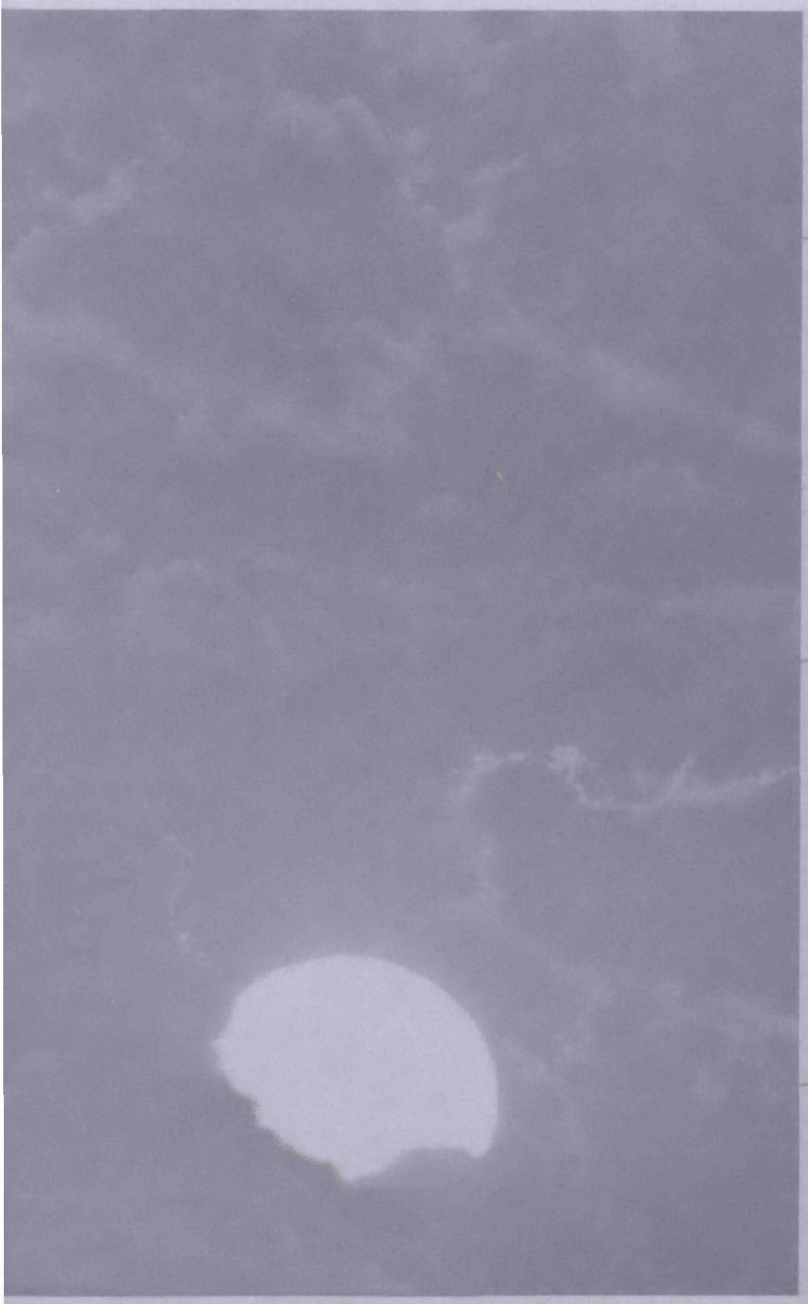
Atmospheric Pollution Prevention Division

ENERGY STAR® and Related Programs 1997 Annual Report



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For additional information, please call the toll-free
ENERGY STAR Hotline at 1-888-STAR-YES (1-888-782-7937).

Introduction

It has been more than two years since the Intergovernmental Panel on Climate Change (IPCC) released its consensus report on global climate change, which concluded that human activity is changing the climate. Although we do not know yet what the precise consequences will be, the IPCC did conclude that a disruption in the climate system "is likely to have wide-ranging and mostly adverse impacts on human health with significant loss of life."

Most greenhouse gas emissions, which contribute to climate change, are caused by the burning of fossil fuels for energy. Roughly a third of these emissions come from transportation, a third from industry, and a third from residential and commercial buildings. In each case, the ways in which we use energy to provide the services we want is inefficient. In some of these sectors, this energy use could be more than 30 percent more efficient, and thus much cleaner, if existing technologies and practices were relied upon. Many efficient technologies not only reduce greenhouse gas emissions, but do so while improving our standards of living and accelerating economic growth.

"For the United States in particular, sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run."

STATEMENT OF MORE THAN 2,000 ECONOMISTS ON CLIMATE CHANGE
JANUARY 1997

Facts About U.S. Energy Use

- The energy used in the average house contributes more greenhouse gas emissions than the average car. These emissions could be 30 percent lower while saving household dollars if houses were equipped with energy-efficient ENERGY STAR®-qualified products or where initially built to ENERGY STAR levels. *If all U.S. residents bought only energy-efficient products marked with the ENERGY STAR label over the next 15 years, we would shrink our cumulative energy bill by $100 billion.*

- The energy used to support the activities of just one office worker for one day causes over twice the pollution as driving to work. These emissions could be 30 percent lower if systematic investments in building systems were made. ENERGY STAR provides a proven, organized approach. *If all building owners took advantage of ENERGY STAR Buildings and Green Lights, they would shrink their cumulative energy bill by $130 billion by 2010.*

- Landfills, gassy coal mines, natural gas systems, and swine and dairy farms are responsible for most anthropogenic emissions of methane, a potent greenhouse gas. When methane is captured and used as an energy source, sizable emissions reductions can be achieved at a profit.

APPD's Programs

EPA's Atmospheric Pollution Prevention Division (APPD) has implemented a number of programs strategically designed to capitalize on these opportunities for improving energy efficiency. The programs overcome the market barriers that slow the rate of investment in available, smart, efficient technologies that can slash operating costs and prevent the emissions of greenhouse gases. The partnerships developed with business, industry, government, and other organizations, through APPD's programs have met with great success. As these programs expand their reach, they will continue to provide tremendous benefits to the environment as well as the U.S. economy. The programs include:

- ENERGY STAR Buildings and Green Lights;
- ENERGY STAR Product Labeling;
- Methane Partnerships; and
- Industry Partnerships to reduce greenhouse gas emissions.

1997 Achievements

1997 was a highly successful year for the Division's partnership programs. Overall, the Division's work yielded the following accomplishments:

- An annual reduction of more than 11 million metric tons of carbon (MMTCE) in greenhouse gas emissions (a 60 percent increase over last year).*
- Cumulative investments in energy-efficient technologies in excess of $1 billion.
- Cumulative energy bill savings of more than $2 billion for consumers and businesses.

In addition the cost of these programs to the government is less than 5% of the total investment spurred by the programs. Key highlights for specific programs include:

- Successful expansion of Green Lights® to a whole building upgrade strategy yielding a total of 1.7 billion of recruited square feet into ENERGY STAR Buildings.
- Expansion of APPD's successful partnership with the U.S. Department of Energy (DOE) on the ENERGY STAR label, with EPA and DOE unveiling several new ENERGY STAR-compliant products.
- Greater consumer recognition of the ENERGY STAR label, now appearing on more than 25 energy-consuming products ranging from refrigerators to heat pumps. Over 3,400 product models now carry the ENERGY STAR label.
- Annual reductions of more than 5 million MMTCE in the emissions of the non-CO_2 gases: methane, HFCs, and PFCs.
- Introduction of privately funded loans for products with the ENERGY STAR label by major financial organizations that lower the overall cost to consumers of buying high-efficiency equipment.

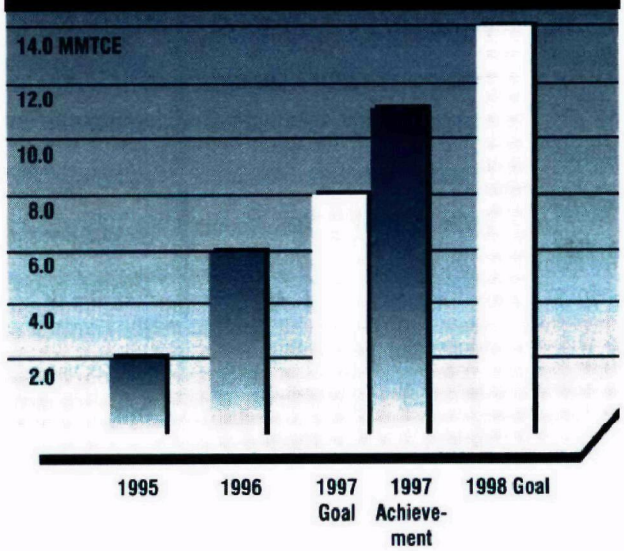
The environmental and financial results of these programs are summarized in the following report.

> ***"Climate change can bring us together around what America does best—we innovate, we compete, we find solutions to problems, and we do it in a way that promotes entrepreneurship and strengthens the American economy."***
>
> PRESIDENT BILL CLINTON
> REMARKS ON CLIMATE CHANGE
> OCTOBER 22, 1997
> NATIONAL GEOGRAPHIC SOCIETY

* Reduction in annual greenhouse gas emissions for all APPD programs, including non-CO_2 gases, expressed as the standardized measure "carbon-equivalents" as defined by the IPCC.

1997 Program Accomplishments

Annual Carbon Reductions Resulting from APPD Programs



Financial Highlights: Based on Total Stream of Savings/Benefits

Net Energy Bill Savings to APPD Partners and Consumers* ..... $19 billion

Million Metric Tons Carbon Equivalent (MMTCE) Reduction due to APPD Programs** ..... 210 MMTCE

Financial Ratios

National Energy Bill Savings per Dollar Spent by APPD ..... $100 per $ spent by APPD

National Energy Bill Savings with Every Ton of Carbon Reduced ..... $90 per metric ton

* Net pre-tax savings over the lifetime of investments to Green Lights®, ENERGY STAR®, and Methane and Utility Program Partners and consumers for upgrades, projects, and purchases completed by the end of 1997 or committed to by the end of 1997. Net pre-tax savings are the additional revenues received above those that would have been received from typical alternative investments. APPD costs have been subtracted.

** Total million metric tons of carbon equivalents (MMTCE) reduced over the lifetime of investments to APPD Program Partners and consumers for upgrades, projects, and purchases completed by the end of 1997 or committed to by the end of 1997.

ENERGY STAR® Program Awards

ENERGY STAR Buildings℠ and Green Lights®

Mobil Corporation (Fairfax, VA)	ENERGY STAR Buildings℠ Partner of the Year
The Trane Company, Applied Global Systems (LaCrosse, WI)	ENERGY STAR Buildings℠ Ally of the Year
Compaq Computer Corporation (Houston, TX)	Green Lights® Corporate Partner of the Year
Louisville & Jefferson County Metropolitan Sewer District (Louisville, KY)	Green Lights® Government Partner of the Year
St. Joseph Hospital (Lancaster, PA)	Green Lights® Healthcare Partner of the Year
Walt Disney World Co. (Lake Buena Vista, FL)	Green Lights® Hospitality Partner of the Year
Davenport Community Schools (Davenport, IA)	Green Lights® Education Partner of the Year
McDonald's (Oak Brook, IL)	Green Lights® Retail Partner of the Year
American Electric Power Company (Columbus, OH)	Green Lights® Ally of the Year
City of Scottsdale (Scottsdale, AZ)	ENERGY STAR Buildings℠ Best Promotion
Johnson & Johnson (New Brunswick, NJ)	Outstanding ENERGY STAR Buildings℠ Upgrade

ENERGY STAR® Homes

Energy Rated Homes of Indiana (Indianapolis, IN)	ENERGY STAR® Homes Home Rating/Tech Support Provider Ally of the Year
Andersen Corporation (Bayport, MN)	Outstanding ENERGY STAR® Homes Manufacturer Ally of the Year
Gainesville Regional Utilities (Gainesville, FL)	Outstanding ENERGY STAR® Homes Utility Ally of the Year
Southlake Development, Inc. (Hobart, IN)	ENERGY STAR® Homes Small Builder of the Year
Watt Homes (Salt Lake City, UT)	ENERGY STAR® Homes Medium Builder of the Year
Best Homes (Indianapolis, IN)	ENERGY STAR® Homes Medium Builder of the Year
Pulte Homes (Phoenix, AZ)	ENERGY STAR® Homes Large Builder of the Year
Palm Harbor Homes, Inc. (Dallas, TX)	ENERGY STAR® Homes Manufactured Home Builder of the Year

ENERGY STAR® Labeling

Ricoh Corporation (Caldwell, NJ)	ENERGY STAR® Office Equipment Imaging Partner of the Year
Samsung Electronics (San Jose, CA)	ENERGY STAR® Office Equipment Monitor Partner of the Year
IBM Corporation (Armonk, NY)	ENERGY STAR® Office Equipment Computer Partner of the Year
Xerox Corporation (Stamford, CT)	ENERGY STAR® Office Equipment Best Promotion
Lithonia Lighting (Decatur, GA)	ENERGY STAR® Exit Sign Partner of the Year

Natural Gas STAR

Marathon (Houston, TX)	Production Partner of the Year
Enron (Houston, TX)	Transmission Partner of the Year
Atlanta Gas Light (Atlanta, GA)	Distribution Partner of the Year

ENERGY STAR for Commercial Buildings

ENERGY STAR Buildings℠ and Green Lights® Partnership promotes energy efficiency as a business strategy that building owners and managers for commercial and industrial buildings can adopt to improve their bottom line and the environment.

A number of major barriers to energy efficiency have been identified in the commercial building marketplace, such as:

- **Lack of technical information**. In most cases commercial and industrial building owners and managers lack objective, accessible information about the benefits of energy-efficiency strategies.

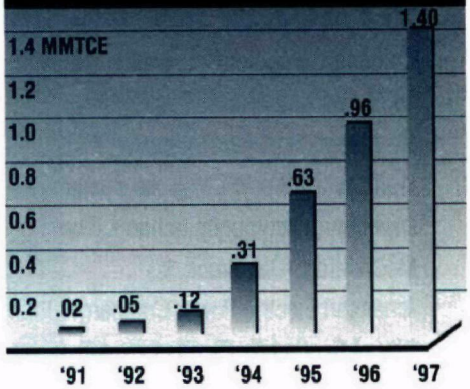
- **Competing vendor claims**. Building owners and managers must often rely on equipment vendors for the information on building products and equipment.

- **Limited financial resources**. Although the purchase price of energy-efficient products is often higher than standard equipment, the cost of owning them over the lifetime of the products is usually substantially lower than the cost of owning standard equipment.

"Green Lights® is a government program that really works. We had no idea that this opportunity was out there, but Green Lights gave us the information and tools we need. Now we are saving $24,000 per year in taxpayer money... ."

DR. BRAD ALLISON
DAVENPORT COMMUNITY SCHOOLS

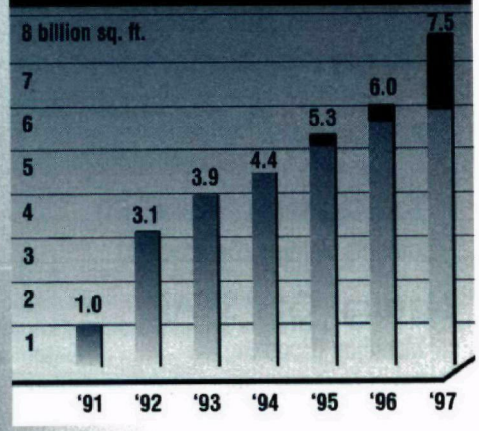
Annual Carbon Emissions Prevented From All Completed Upgrades



Who We Are

ENERGY STAR Buildings and Green Lights is designed to address these market barriers to smart energy management practices. The voluntary partnership between EPA and building owners/managers help U.S. businesses design and implement strategies that eliminate wasted energy and reduce energy costs.

Total Square Feet Recruited for ENERGY STAR Buildings℠ and Green Lights® Partnership*



*All square footage is committed to lighting upgrades (Green Lights). The dark areas (1995-1997) represent square footage that go beyond lighting and pursue whole-building upgrades (ENERGY STAR Buildings).

ENERGY STAR Buildings and Green Lights spurs investment in energy-efficient building technologies and practices by partnering with U.S. businesses. The partnership offers a proven, systematic approach to performing building upgrades that maximize energy savings. By installing energy-efficient lighting, ventilation, and heating and cooling technologies in existing buildings, many companies can reduce their total energy bill by 30 percent or more. For example, lighting accounts for 30 to 40 percent of electricity use in commercial buildings. An investment in a lighting upgrade project through Green Lights (the first stage of the ENERGY STAR Buildings strategy) can reduce the energy needed for lighting by over 40 percent. In addition, the investments will earn, on average, 35 percent a year—with less risk than most alternative investments.

ENERGY STAR Buildings℠ Guidelines

ENERGY STAR Buildings has five guiding principles that will improve energy efficiency in commercial and industrial buildings across America:

- Energy efficiency investments are good business decisions
- The program provides organizations with a systematic approach to building upgrades that maximize savings
- Quality of space and worker comfort are maintained or enhanced by efficiency upgrades
- Energy efficient upgrades enhance the asset value of a building and
- There are no remaining reasons for saying "no" to energy efficiency.

ENERGY STAR Small Business℠

The ENERGY STAR Small Business℠ Program encourages businesses and organizations with less than 100,000 square feet to make the same energy-efficiency improvements in their facilities as larger businesses. ENERGY STAR Small Business tailors the ENERGY STAR Buildings Program to meet the needs of small business. The energy-efficiency message is delivered through recognized networks such as the Small Business Administration's Small Business Development Centers, Chambers of Commerce, and EPA/DOE regional offices.

1997 Accomplishments

The Partners

Energy Star Buildings and Green Lights has seen tremendous success in 1997. With the addition of 250 participants in 1997, Green Lights has grown from 39 Charter members in 1991 to more than 2,500 participants, including corporations, universities, healthcare facilities, nonprofit organizations, school districts, federal agencies and local governments, and small businesses.

In 1997 EPA recruited 1.5 billion square feet into the Partnership, bringing the total to 7.5 billion square feet. This figure represents 10 percent of the total commercial building space in the country. Over 70 percent, 1.1 billion square feet, of the total space recruited into the program in 1997 will take their energy-efficient upgrades beyond lighting upgrades, demonstrating a shift in focus from lighting upgrades to the strategic, whole-building upgrade approach.

If all building owners join Energy Star Buildings℠ and Green Lights® and implement cost-effective efficiency opportunities by 2010, they will shrink their cumulative energy bills by $130 billion and reduce greenhouse gas pollution equivalent to eliminating the emissions from 20 million cars for the next decade.

The Savings

More than 4 percent of U.S. buildings have undergone upgrades. As a result, businesses across the nation have reduced their annual energy use by 6.9 billion kilowatt hours, and they have saved $500 million on energy bills this year with Energy Star Buildings and Green Lights. In 1997 these participants in the program also prevented the emissions of 1.4 million metric tons of carbon equivalent (MMTCE) of greenhouse gases—the equivalent of removing more than 1 million cars from the road.* Since 1991, participants have prevented emissions of 2.7 MMTCE—equivalent to avoiding the pollution from over 2 million cars. EPA predicts that by the year 2000 Energy Star Buildings and Green Lights will have prevented the emissions of more than 5.5 MMTCE.

The Recognition

Energy Star Buildings and Green Lights recognized its participants in 1997 for their contribution to energy efficiency and environmental protection. Efforts to increase public awareness brought EPA 40 placements of Energy Star Buildings and Green Lights public service announcements in national and regional business publications such as *Fortune*, *Newsweek*, and the *Harvard Business Review* (see p .22). In 1997 the EPA reached an estimated 17 million people through these activities. At its annual awards cer-

*These estimates are based on a factor of the average car emits 10,000 lbs of carbon dioxide per year.

emony, the Partnership honored 11 participants, representing several major sectors, with the prestigious Partner of the Year awards.

The ENERGY STAR Small Business Program also had an exceptional year. Participation more than quadrupled in size, growing from 21 participants at the end of 1996 to 104 participants by the end of 1997. The amount of committed floor space grew as well. At year's end, more than 1.4 million square feet was signed up. This figure represents a four-fold increase over the 340,000 square feet committed by the end of 1996.

What's Ahead

ENERGY STAR Buildings and Green Lights plans to move aggressively to meet its goals for 1998. The Partnership plans to save 12.2 billion kilowatt hours (kWh) and prevent the emissions of 2.4 million metric tons of carbon equivalent of potential greenhouse gases.

Green Lights is being fully integrated into ENERGY STAR Buildings. This transition will allow for a uniform message of comprehensive building upgrades to be transmitted to all participants, current and prospective.

The business unit is developing a performance-based metric or label for buildings that have achieved energy excellence. This label will signify that the building's energy performance places it in the top of its market, establishing a level playing field for all buildings, new and existing. Displaying the label will increase the asset value of the building, and the label itself will serve as a symbol of environmental leadership. This label will be available in 1998.

Energy Star Buildings℠ and Green Lights®
Partnership Goals and Achievements

	1997 Goal	1997 Achievement	1998 Goal
Square Feet Recruited – lighting (billion)	7.5	7.5	9.0
Square Feet Recruited – whole building (billion)	1.6	1.7	3.1
Floorspace Upgraded (billion sq. ft.)	2.5	2.8	4.0
Annual Energy Savings Earned (billion kWh)	7.2	7.1	12.2

ENERGY STAR® Product Labeling

Evidence is growing that American consumers are "underinvesting" in technologies that can help them reduce energy use, save money, and reduce the emission of greenhouse gases. A recent study completed by the Department of Energy found that the United States could reduce its greenhouse gas emissions by 20 percent by 2010 simply by investing in existing, proven, and cost-effective energy-efficiency technologies.

"If over the next 15 years everyone were to buy only those energy-efficient products marked in stores with EPA's distinctive ENERGY STAR label, we could shrink our energy bills by a total of about $100 billion over the next 15 years and dramatically cut greenhouse gas emissions."

PRESIDENT BILL CLINTON
REMARKS ON CLIMATE CHANGE
OCTOBER 22, 1997
NATIONAL GEOGRAPHIC SOCIETY

There are a number of barriers to investments in energy efficiency, including:

- *Lack of information.* In many instances, consumers lack objective, accessible information about the benefits of energy-efficient products.
- *Confusion on the part of consumers.* The methodologies for measuring the efficiency of products are often unavailable to consumers or are based on highly technical measurements, making it difficult for the consumer to judge the relative benefits of the product.
- *Higher purchase price for energy-efficient products.* Despite the fact that the total ownership costs of an efficient product are often lower, the purchase price can be higher.

Who We Are

ENERGY STAR, jointly run by EPA and the U.S. Department of Energy, is designed to address market barriers to investment in energy-efficient technologies. These voluntary, market-based programs accomplish this by working with manufac-

turers, distributors, utilities, energy-efficiency advocates, consumers, and other organizations to:

◆ *Label energy-efficient products.* Working with manufacturers and other interested parties, EPA and DOE establish energy-efficiency specifications for existing, proven technologies. Products that exceed these energy-efficiency levels can be identified with the distinctive ENERGY STAR label. This label allows consumers to readily identify and purchase the most energy-efficient products on the market.

◆ *Provide objective information to consumers.* The ENERGY STAR Program produces non-technical fact sheets, brochures, and interactive websites that help consumers better understand the economic and environmental benefits of using energy-efficient products. This information also gives consumers a way to verify manufacturers' efficiency claims for their products.

◆ *Work with national, regional, and local groups to promote energy efficiency.* Many private and public groups, including energy-efficiency advocacy groups, utilities, retailers, and others, serve as a valuable source of information for consumers. The ENERGY STAR Program works actively with these groups to not only promote the ENERGY STAR message, but also to ensure that the message reflects local concerns and needs.

◆ *Lower the costs of owning energy-efficient equipment and products through alternative financing.* Many financial institutions now recognize that energy-efficient products represent a market opportunity. The ENERGY STAR Program works with these companies to develop these products and to devise alternative financing for them, so consumers can reduce the overall costs

ENERGY STAR®-Labeled Products January 1998

HOME ELECTRONICS
Televisions
VCRs
TV/VCR Combination Units

OFFICE EQUIPMENT
Computers
Monitors
Copiers
Fax Machines
Multifunction Devices
Printers
Scanners

APPLIANCES
Dishwashers
Refrigerators
Room A/C Units
Clothes Washers

RESIDENTIAL HEATING & COOLING EQUIPMENT
Boilers
Central A/C
Furnaces
Heat Pumps
Thermostats

OTHER PRODUCTS
Windows (3/98)
Exit Signs
Insulation
Home Lamps and Lighting Fixtures
Transformers

NEW HOMES

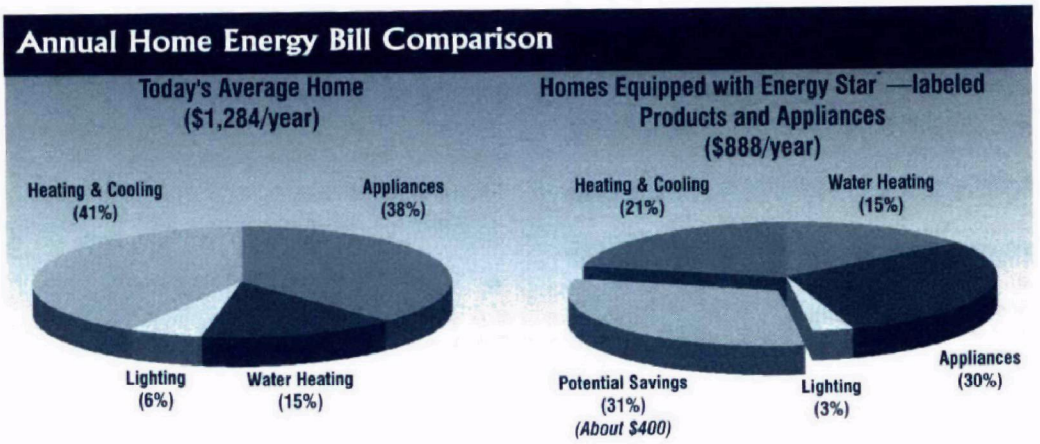
of owning ENERGY STAR-compliant products and equipment.

As of January 1998, the ENERGY STAR label appears on more than 25 energy-consuming products, ranging from computers to refrigerators to central air conditioning units. The number of ENERGY STAR-qualified models across these products has grown to 3,400 in the past year. The ENERGY STAR Program has also established strong working relationships with state and local organizations to ensure that all consumers receive consistent and cost-effective messages about the benefits of energy efficiency.

1997 Accomplishments

Products bearing the ENERGY STAR label helped consumers save more than $740 million this year and reduce pollution by 2.0 MMTCE. This figure is equivalent to removing the pollution from more than 1.5 million cars from the road.

Aggressive and comprehensive consumer awareness efforts in 1997 greatly increased the public's recognition of the ENERGY STAR label. Public service announcements appeared on TV, in print media, and on mass-transit bulletins in cities such as San Francisco, Minneapolis, Chicago, and Dallas. More than 200 news articles and TV



Source: Annual energy cost and savings estimated by LBNL, using 1993 RECS data.

news stories about ENERGY STAR appeared in various markets around the country.

In 1997, the ENERGY STAR Programs:

- Introduced the ENERGY STAR Residential Light Fixtures Program.
- Tightened specifications for "sleep mode" wattage on computer monitors and the extended ENERGY STAR label to high-end computers.
- Developed successful training programs for the ENERGY STAR Residential Heating and Cooling Program, which has been well-received by the heating and cooling industry.
- Introduced ENERGY STAR loans for ENERGY STAR-compliant heating and cooling equipment.

What's Ahead

The ENERGY STAR Labeling Program continues to grow. The Division announced a new Consumer Electronics labeling effort in January 1998. Even before this announcement, ENERGY STAR labeling had commitments from most of the major TV and VCR manufacturers. These charter partners account for approximately 80 percent of the TV and 75 percent of the VCR markets.

Another effort from the Labeling Program is the "ENERGY STAR Roofs" initiative. ENERGY STAR Roofs will work to increase the use of materials that can lower roof temperatures, thereby cutting the amount of energy needed to cool homes.

> ***"[The] ENERGY STAR partnership shows how government and business can work together to drive the marketplace toward energy efficiency–to grow the economy while protecting the environment."***
>
> VICE PRESIDENT AL GORE
> JANUARY 8, 1998
> INTERNATIONAL CONSUMER ELECTRONICS TRADE SHOW

APPD will continue to label new ENERGY STAR-qualified products, focus on new markets and partner groups, and achieve greater market penetration of existing ENERGY STAR-compliant products.

ENERGY STAR Office Equipment

What They Are

ENERGY STAR-labeled office equipment powers down to a low-power state when not in use, thus reducing wasted electricity. This "sleep" feature can reduce the total energy consumption of office equipment by 50 percent or more. To qualify, each category of products must power down below a specified watt level after a predetermined time of inactivity. ENERGY STAR-labeled office equipment includes computers, monitors, printers, faxes, copiers, scanners, and multifunction devices.

Energy consumption from these products is the fastest growing use of electricity in the commercial sector.

In 1997, ENERGY STAR office equipment saved businesses and consumers $740 million; additional use of ENERGY STAR office equipment could increase these total savings to more than $1.5 billion.

1997 Accomplishments

In 1997 the ENERGY STAR-labeled office equipment saved more than 10 billion kilowatt hours of energy, roughly equivalent to eliminating the pollution of 1.6 million cars or planting 2.2 million acres of trees. Add that to the cumulative total of 19 billion kilowatt hours saved since the label first appeared in 1993, and ENERGY STAR Office Equipment has reduced the nation's energy bills by $1 billion.

Fifty-seven participants joined Office Equipment in 1997, bringing the total number of participants to 641 worldwide. With participants in 23 countries, including Australia, Korea, and Japan, ENERGY STAR is working to make offices worldwide more energy efficient.

ENERGY STAR® Office Equipment Goals and Achievements

	1997 Goal	1997 Achievement*	1998 Goal
Percent of Market with ENERGY STAR Feature:			
Computers	80%	80%	80%
Monitors	95%	95%	95%
Printers	99%	99%	99%
Fax Machines	70%	70%	90%
Copiers	45%	45%	65%
Annual Energy Savings (billion kWh)	10.1	9.0	14.9

* Estimates based on 1996 market data and consultation with manufacturers.

ENERGY STAR Residential Heating and Cooling Equipment

What They Are

Heating and cooling is one of the top energy expenditures in most U.S. homes. ENERGY STAR-labeled central air conditioners, heat pumps, furnaces, boilers, geothermal heat pumps, gas-fired heat pumps, and programmable thermostats can help consumers reduce these costs without sacrificing features, performance, or comfort.

1997 Accomplishments

In 1997 the ENERGY STAR program began working with the financing industry to make special, privately funded loans available to help consumers purchase ENERGY STAR-compliant heating and cooling equipment. The program's success to date and its potential for future success are demonstrated by the volume of ENERGY STAR loans that have already been approved. Since the program's inception in January 1997, the compounded monthly growth in loan volume has been 55 percent. EPA has been working to attract additional finance partners, so consumers will have more financing options available to consumers them for purchasing high-efficiency heating and cooling equipment.

In the spring of 1998, EPA will work with MBNA, a leading consumer credit company, to pilot test a new loan product for ENERGY STAR-labeled equipment. The loan product will offer consumers a reduced interest rate on ENERGY STAR-qualified equipment and longer repayment terms than standard financing products.

The "Train-the-Trainer" sales training program developed by EPA has also met with fabulous success. The training sessions, designed for HVAC contractors, stress the importance of teaching consumers about the benefits of buying heating and cooling equipment that displays the ENERGY STAR label. In the program's first year, 30,000 independent HVAC contractors, about 3 percent of the total number of HVAC contractors, have been trained.

> ***"We are very pleased with our ENERGY STAR-labeled equipment. We now have sufficient heating and cooling with increased comfort, and yet our costs are down. From August to December, we saved approximately $75 on our utility bills."***
>
> ERNIE AND ANN VAN DEVER
> SAN CARLOS, CA

ENERGY STAR Residential Light Fixtures

What They Are

ENERGY STAR residential light fixtures cover indoor and outdoor fixtures that are both hardwired and portable. Most of these fixtures are "dedicated," which means that they are designed to use only energy-efficient light bulbs.

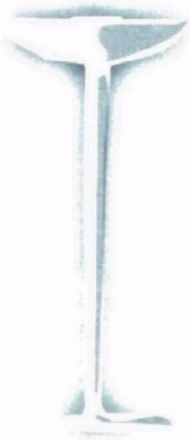
These light fixtures deliver the same or better lighting quality than traditional incandescent fixtures. They start immediately, operate quietly, and often include dimming or switching capability. The outdoor fixtures automatically turn off in daylight, and some have motion detectors.

Established in March 1997, the ENERGY STAR Residential Light Fixtures Program is one of the newest labeling programs. Manufacturers agree to use the ENERGY STAR label on residential light fixtures that meet ENERGY STAR specifications for energy efficiency, safety, reliability, and quality.

Consumers spent over $11 billion on residential lighting in 1997. Using energy-efficient lighting can reduce this expenditure by more than 50 percent, or $5.8 billion.

1997 Accomplishments

Residential light fixtures bearing the ENERGY STAR label were introduced in 1997 by 12 manufacturer Partners. By the end of 1997, the number of participants had more than doubled to 26 manufacturer Partners. The use of residential light fixtures saved the United States 11 million kilowatt hours in 1997, which translates into $800,000 in energy costs. This accomplishment is equivalent to eliminateing the pollution of more than 1,500 cars.



Residential Light Fixtures - Case Study

Bright 300-watt halogen torchiere lamps have become one of the most popular indoor residential light fixtures on the market, with over 40 million sold in the United States in the past decade.

Unfortunately, these lights not only waste energy, they can also pose serious fire threats in homes, offices, and dorm rooms.

Recent advances by Lawrence Berkeley Laboratories in the development of highly efficient light sources has led to a new generation of ENERGY STAR-labeled fixtures that use less energy and operate at much lower temperatures.

The ENERGY STAR-compliant light fixtures look the same and provide the same amount of light as the halogen lamps while saving a tremendous amount of energy. These lamps also operate at much safer temperatures and can save consumers more than $150 in energy bill savings over the life of each fixture.

ENERGY STAR Exit Signs

What They Are

ENERGY STAR-labeled exit signs use 75 percent less energy than a typical exit sign, saving $15-20 yearly on electricity costs. Using these technologically advanced signs can also help businesses substantially reduce their maintenance costs for exit signs. ENERGY STAR-compliant exit signs exceed current National Fire Protection Association standards for luminance and visibility.

More than 100 million exit signs are in use in buildings throughout the country. They operate 24 hours a day, 365 days a year. Operating these signs costs $1 billion over the course of a year.

1997 Accomplishments

The ENERGY STAR Program labels energy-efficient exit signs and works with manufacturer partners to ensure that energy-efficient exit signs are prominently displayed in the marketplace. The program also promotes the benefits of using energy efficient exit signs to businesses and consumers.

In 1997 more than 720,000 ENERGY STAR-labeled exit signs were sold, bringing the total number of purchases to over 1 million. The use of ENERGY STAR-qualified exit signs saved in excess of $18 million in operating and electricity costs. They also prevented over 236.5 billion kilowatt hours of electricity from being wasted.

Businesses spent in excess of $1 billion to operate exit signs in 1997. Using energy-efficient exit signs can reduce this expenditure by $700 million.

Postal Service Replaces 30,000 Exit Signs

The US Postal Service has launched an ambitious program to replace 15,000 exit signs in post offices nationwide with energy-efficient LED (light-emitting diode) signs that use up to 75 percent less energy than existing signs, while reducing maintenance costs and offering improved visibility and safety.

The Postal Service program is the first major commitment by a federal buyer to use exit signs that qualify for the ENERGY STAR® label. These LED exit signs, which operate continually, are expected to reduce Postal Service energy costs by more than $400,000 per year. Because LED signs last 10 years or more, significant savings are achieved in avoided maintenance costs. In contrast, standard lamps need to be replaced up to three times a year.

ENERGY STAR Insulation

What It Is

Insulation has recently been added to EPA's list of ENERGY STAR qualifying products. Many homes, in particular older homes, are not properly insulated. Properly installed insulation is a smart and proven way to save energy and improve the quality of a home while saving money through lower utility bills. By merely insulating an attic, a homeowner can reduce their home energy use by 10 to 20 percent.

1997 Accomplishments

After introducing the ENERGY STAR label for insulation in 1997, EPA has developed and completed an *Insulation Guide*. The guide helps consumers choose and properly install the most appropriate insulation for their home.

Participating manufacturers of insulation have agreed to place the ENERGY STAR label on the packaging of their ENERGY STAR-compliant products. They have also agreed to distribute the *Insulation Guide* everywhere that ENERGY STAR insulation is sold.

In addition, the ENERGY STAR Program continues to work with manufacturers, utilities, trade associations, energy-efficiency groups, and distributors to publicize the benefits of properly using insulation.

More than half the energy used in a home goes to heating and cooling. By insulating their attics, residents can reduce home energy use by 10 to 20 percent.

The ENERGY STAR® Label

The ENERGY STAR Label represents an ongoing, successful partnership between the Environmental Protection Agency (EPA) and the Department of Energy (DOE). It promotes energy efficiency and increases consumer recognition of the label while reducing the environmental threat of global warming.

To date the partnership has been extremely effective. More than 3,400 models of a variety of products have been qualified as ENERGY STAR. In addition, consumer awareness of the benefits of energy efficiency has been increased.

DOE manages product areas such as appliances (dishwashers, refrigerators, clothes washers), room air conditioners, and windows. EPA manages product areas such as: office equipment, consumer electronics, home heating and cooling equipment, and related products.

ENERGY STAR Transformers

What They Are

The ENERGY STAR Transformer Program promotes the environmental and economic benefits of cost-effective, high-efficiency transformers to electric utilities. The program accomplishes these goals by

- Preparing technical reports and studies on the economic and regulatory issues surrounding transformer purchases for utilities and regulators.

- Developing (in conjunction with the electric utility industry) technical software programs that allow users to perform complex transformer cost-effectiveness and sizing analyses.

- Helping program participants promote their energy-efficiency efforts through the use of the ENERGY STAR name and logo and through the preparation of informative materials for their customers.

1997 Accomplishments

In 1997 the ENERGY STAR Transformer Program helped its member utilities reduce energy losses by approximately 30.5 million kilowatt-hours, the equivalent of eliminating the pollution of 5,000 cars. The program also signed up 11 new utility partners as participants in the program.

Finally, the ENERGY STAR Transformer Program distributed more than 200 copies of its unique DITCEM software to utilities. The software program allows many utilities (particularly small, publicly owned utilities) to more accurately select the most cost-effective and efficient transformer for their needs.

In 1998 the program will continue recruiting new utility partners. It will also announce a new ENERGY STAR-labeled product—high-efficiency transformers that are available in the commercial and industrial sectors. The ENERGY STAR Transformer Program has developed new cost-effectiveness software for these transformers. This software is currently being field tested.

In 1997, more than $1 billion was wasted as a result of transformer inefficiencies. If businesses used transformer technologies that are currently available, they could cost-effectively reduce these energy losses by as much as 40 percent.

"EEI and the electric industry have been very supportive of the ENERGY STAR Transformer Program. It's an example of a great program that helps economic efficiency, helps the environment, and helps lower customers' utility bills."

TOM KUHN
PRESIDENT, EDISON ELECTRIC INSTITUTE

ENERGY STAR Homes

Who We Are

The ENERGY STAR Homes Program is a public/private partnership between the U.S. EPA and new home builders and developers, energy-efficiency allies,* and others in the residential housing industry. The primary purpose of ENERGY STAR Homes is to transform the market for energy efficiency in new housing by improving builder profitability, home quality and homeowner comfort; lowering energy demand; reducing air pollution; and enhancing the national economy. As with all ENERGY STAR Programs, the commitments made through the ENERGY STAR Homes Program are entirely voluntary.

1997 Accomplishments

In 1997 the ENERGY STAR Homes Program was distinguished not only by its exponential growth but also by the clear transition from development to implementation and home certification. In 1997 the number of homes displaying the ENERGY STAR label grew from less than 200 to more than 1200 in 30 different states. In addition, the number of allies expanded from 44 to more than 240, including 25 utilities that are promoting the program.

Since its launch in October 1995, ENERGY STAR Homes has grown to include more than 370 builders in 48 states, and five lenders offering ENERGY STAR mortgages.

In 1997 ENERGY STAR Homes expanded to include the manufactured housing industry, a development that will increase the potential for reducing emissions. This program is also planning to

ENERGY STAR® Mortgages

ENERGY STAR Mortgage Partners recognize the financial value of ENERGY STAR Homes. Chase Manhattan, Countrywide and PHH Mortgage as well as several regional lenders offer special mortgage terms for ENERGY STAR home buyers. These terms may include reduced closing costs, more liberal underwriting requirements, and a higher appraised home value.

*Allies include utility companies; insulation and window manufacturers; heating, ventilation, and air conditioning (HVAC)/water heater equipment manufacturers; home energy rating system providers and raters; industry trade associations; energy service companies; etc.

expand to the existing homes market, a move which has significant potential for pollution prevention and energy bill savings for consumers.

What's Ahead

As ENERGY STAR Homes continues to grow and expand, EPA plans to increase market penetration as well as consumer awareness of the program. APPD anticipates that by the end of 1998, 10,000 ENERGY STAR-qualified homes will be in the ground, a number that far exceeds existing goals. ENERGY STAR Homes is working toward having at least 10 percent of the annual U.S. new construction market (equal to 100,000 homes) built to ENERGY STAR guidelines by the year 2002 and 95 percent by the year 2012. Achieving these goals would constitute a complete transformation of the new homes market.

> ***"The ENERGY STAR Homes Program not only assures a quality-built, state-of-the-art product, it affords us a tremendous marketing opportunity."***
>
> MICHAEL B. DAVIS
> PRESIDENT, BEST HOMES

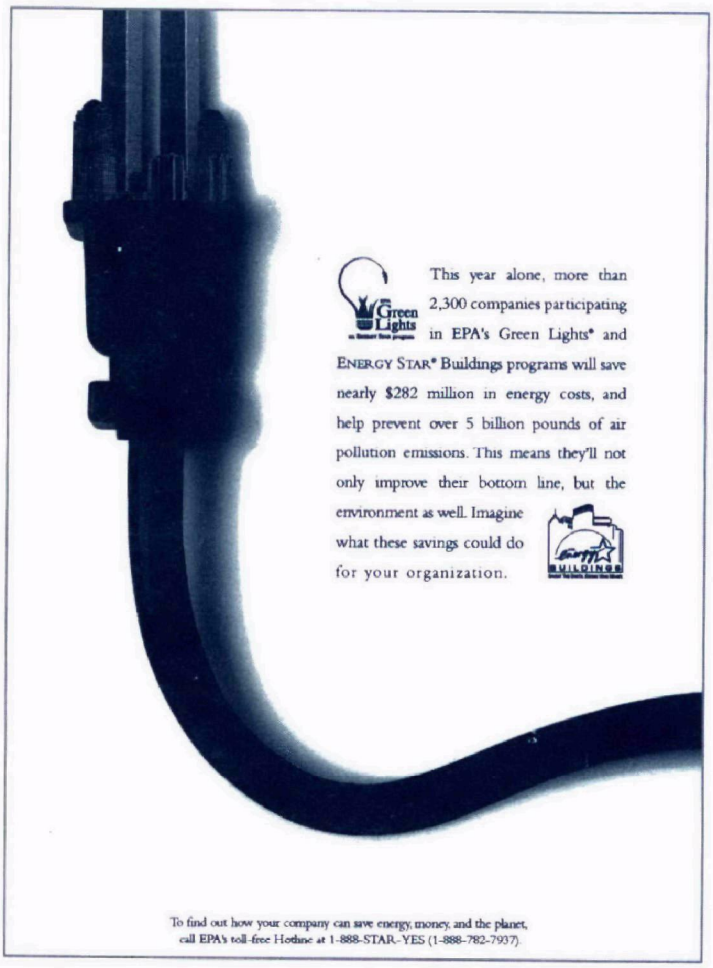
ENERGY STAR® Homes Case Study

Pulte Homes, one of America's leading home builders, is increasing its participation in the Energy Star Homes program. Pulte divisions in Phoenix, AZ, and Las Vegas, NV, have been active in Energy Star Homes since 1997; they have have recently been joined by Pulte's Grand Rapids, MI, division. "Our Energy Star designation allows us to differentiate ourselves from the competition and confirms our commitment to energy efficiency," says Richard Obernesser, director of sales and marketing for the Phoenix division. "We are contributing to the long-term satisfaction of the home owner because of the savings and energy efficiency they will notice when they open their utility bills," he adds.

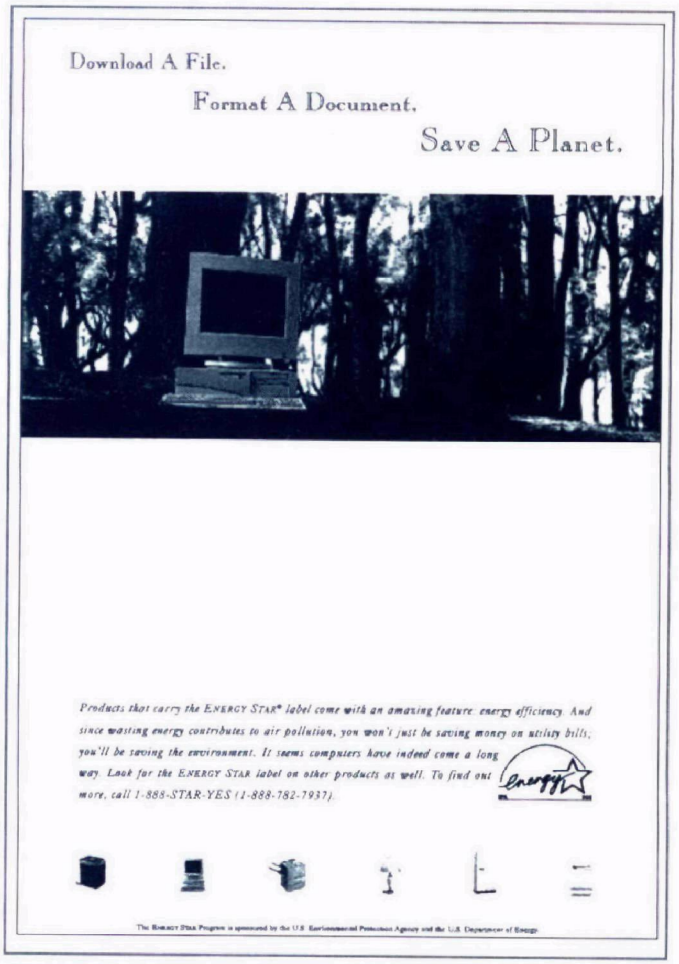
In the hot, arid Phoenix climate, Pulte employs a combination of energy-efficiency strategies that includes more insulation, window shade screens, and double-pane insulated windows. According to Obernesser, the Energy Star label "gives Pulte's customers a reputable source that can validate the importance of energy-efficient features" in a Pulte home.

Public Recognition

Recognition is an essential part of EPA's partnership programs. From generating awareness for the ENERGY STAR label among the American public to recognizing the leadership of exemplary participants, recognition complements the technical tools provided that help decision makers act. 1997 was a successful year for these

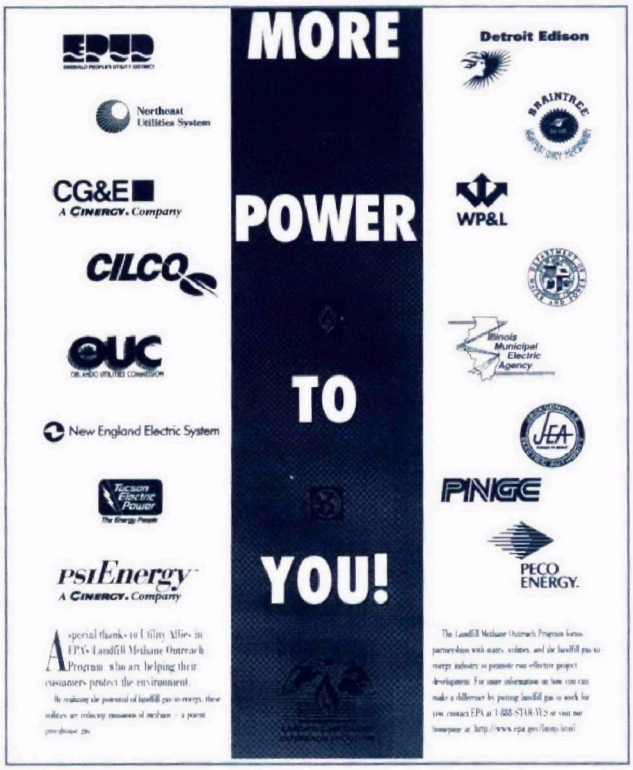


Developed for the ENERGY STAR Buildings℠ and Green Lights® Partnership, this marketing PSA was designed to provoke the interest of major corporations in joining the Green Lights and ENERGY STAR Buildings Partnership. The PSA has been placed in publications such as Fortune and Business Week.

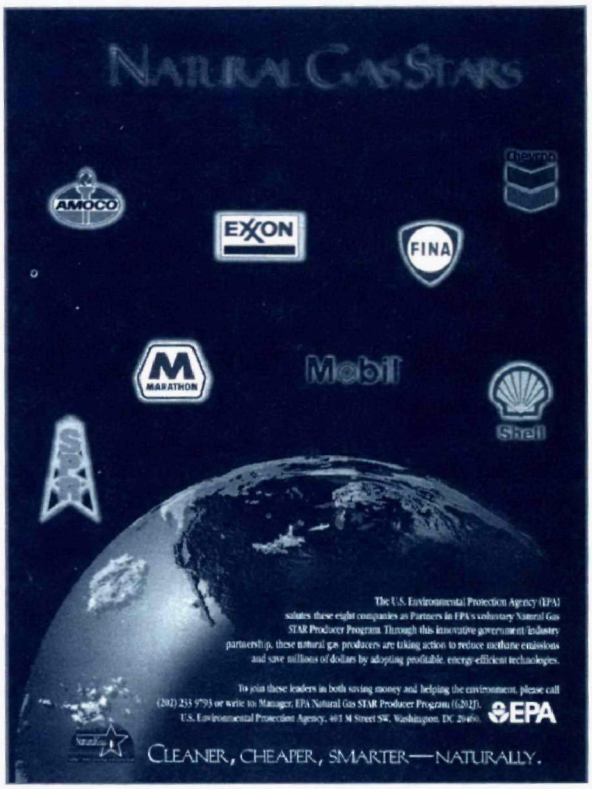


Developed as part of a series (others include a refrigerator and air conditioner) this PSA uses a computer to increase the public's recognition of the ENERGY STAR label-the symbol for energy efficiency. This PSA has been in publications such as Mens Health and Mother Jones.

recognition activities. Following are a few examples of public service announcements developed in 1997. Publications such as Fortune, Newsweek and MSW Management have run these PSAs. These, in addition to other PSA's, have been placed at no cost to the government in more than 90 publications.



The Landfill Methane Outreach Program developed this PSA to recognize the Allies of the Utility Ally Program. This PSA, mainly used for trade publications, has been seen in MSW Management.



Natural Gas STAR developed this PSA to recognize the Partners in the Natural Gas STAR Producer Program. It has been placed in trade publications such as Gas Industry.

Methane Programs

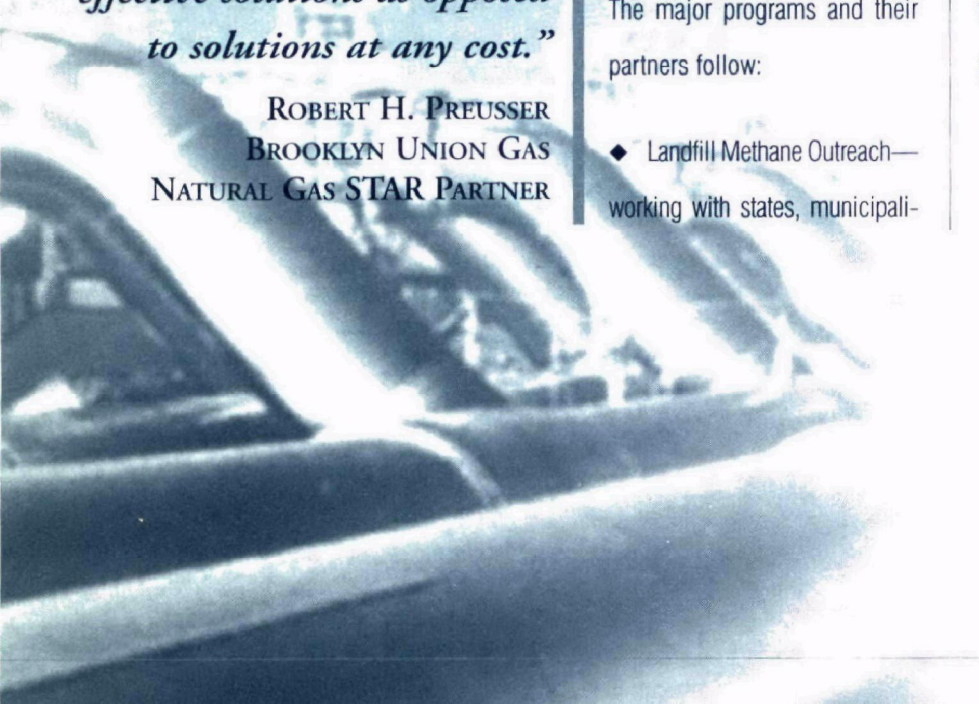
Who We Are

The Methane Programs consist of five programs that reduce emissions of methane, a potent greenhouse gas, from the largest man-made sources. These programs promote methods for the recovery and use of otherwise wasted methane. EPA's partners and allies in these programs are diverse, encompassing major sectors of the economy and several of the nation's key industries. By focusing on the particular needs and conditions of each industry, the programs are achieving great successes. The major programs and their partners follow:

"The most important message of the program is that regulators and industry can work together effectively to solve problems. The real enticement of the program is that it emphasizes cost-effective solutions as opposed to solutions at any cost."

ROBERT H. PREUSSER
BROOKLYN UNION GAS
NATURAL GAS STAR PARTNER

- Landfill Methane Outreach—working with states, municipalities, utilities, and the landfill gas-to-energy industry to collect and use methane from landfills.
- Coalbed Methane Outreach—working with the coal and natural gas industries to collect and use methane that is released during mining.
- Natural Gas STAR—working with the companies that produce, transmit, and distribute natural gas to reduce leaks and losses of methane.
- AgSTAR—working with large livestock producers to encourage methane recovery from animal waste.
- Ruminant Livestock Efficiency—working with livestock producers to improve animal nutrition and management, thereby boosting animal productivity and cutting methane emissions.

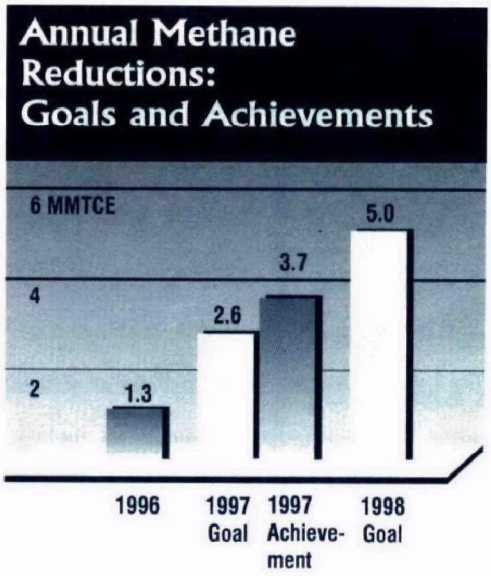


1997 Accomplishments

APPD's methane reduction programs achieved substantial success in 1997. These programs established working partnerships with 239 companies, 84 farms, 20 energy companies, 19 states, and 5 communities. The partnerships have enabled the programs to surpass their methane emissions reduction goals for 1997.

What's Ahead

All of the programs have moved beyond their start-up phases into full marketing and implementation, with significant methane recovery and efficiency gains on target for upcoming years. Key activities for 1998 and beyond include workshops, completion of technical support tools, and targeted project analyses. The methane programs will also focus on publicly recognizing participant achievements and initiatives.



Landfill Methane Outreach Program

Who We Are

The Landfill Methane Outreach Program (LMOP) works with the landfill gas industry, utilities, states, and communities to overcome barriers to developing successful and cost-effective landfill gas-to-energy projects. Since its inception, 95 landfill gas service companies, 20 energy companies, 19 state agencies, and 5 communities have joined the program as voluntary participants.

" This is a good move for energy users and the environment... . If we can use landfill gas to generate electricity, we can displace fossil fuels and help keep energy dollars in the local economy. It's a winner for everyone."

JUDITH MERCHANT
WASHINGTON STATE
ENERGY OFFICE

1997 Accomplishments

Information and project facilitation services provided by the program helped more than 20 landfill gas-to-energy projects become operational this year. The energy recovered from these projects will produce enough electricity to power more than 44,000 houses annually. In addition, these projects will reduce enough greenhouse gas emissions each year to equal the removal of 1.4 million cars from the road and the planting of 940,000 acres of trees.

Twenty-six new participants joined the program this year. In addition, five communities joined the

program, so they could begin developing landfill gas recovery projects in their municipalities. This aspect of the Landfill Methane Outreach Program will ensure that all communities are aware of the benefits that come from a landfill gas-to-energy project.

In addition to gaining new members, the program produced a number of new tools that will help both current and future participants. The program released E-PLUS, a project evaluation software tool, and the Project Development Handbook.

What's Ahead

This document explains landfill gas generation as well as landfill gas-to-energy technologies and costs. It also gives guidelines for financing options. By the year 2000, the program hopes to spur an approximately 200 percent increase in the number of landfill gas-to-energy projects, which would provide enough energy to power about 1.5 million homes. By the end of 1998, three years after its launch, the program seeks to further expand its membership to include those states that collectively represent 65 percent of the U.S. landfill gas-to-energy potential, at least 40 energy companies, and virtually all of the industry's landfill gas service companies.

> *"The [Landfill Methane Outreach] Program offers a unique win-win opportunity to both reduce greenhouse gases and obtain free or low-cost fuel... ."*
>
> ROBERT KAPPELMAN
> JACKSONVILLE ELECTRIC AUTHORITY

Landfill Methane Outreach Program Goals and Achievements

	1997 Goal	1997 Achievement	1998 Goal
Number of New Energy Projects	25.0	20.0	55.0
Annual Methane Savings (trillion BTUs)	3.0	7.8	6.0

Coalbed Methane Outreach Program

Who We Are

The Coalbed Methane Outreach Program (CMOP) encourages coal mines to recover and use coal mine methane as an energy source. The program helps facilitate projects by providing economic and technical assessments of potential coal mine methane projects, information on project financing, and detailed information on new equipment and techniques for methane recovery.

1997 Accomplishments

In 1997 the Coalbed Methane Outreach Program facilitated the development of three coal mine methane projects, bringing the total to 15. These projects, along with all other CMOP projects, reduced methane emissions by 15 billion cubic feet (1.5 MMTCE) in 1997 while generating $30 million in direct gas sales. This reduction in methane emissions is equivalent to removing more than one million cars from the road per year, putting the program ahead of its 1998 goals.

The program's outreach efforts focus on providing high-quality, project-specific information to coal mine operators. This year, these outreach efforts greatly expanded as the program developed working relationships with a number of additional coal mines. The program is currently working with 10 coal mines, 5 coal companies, and 2 electric utilities. The Coalbed Methane Outreach Program is continuing to develop workshops, take advantage of speaking opportunities to publicize the program, and develop new fact sheets as well as other technical publications.

What's Ahead

By the year 2000, the program's goal is to have coal mine methane projects in 20 U.S. mines. If this goal is met, the recovered methane could supply the natural gas needs of more than 500,000 average American homes. In addition, the reduction in greenhouse gas emissions would result in the equivalent of 5.4 million cars being removed from America's roads.

Coalbed Methane Outreach Program Goals and Achievements

	1997 Goal	1997 Achievement	1998 Goal
Total Number of Projects	13.0	15.0	17.0
Annual Methane Savings (trillion BTUs)*	27.2	33.8	33.6

* Includes both CCAP program and base reductions.

Natural Gas STAR

Who We Are

The Natural Gas STAR Program helps gas companies identify and implement cost-effective opportunities to reduce gas leaks and the resulting methane emissions. Natural Gas STAR helps natural gas production, transmission, and distribution facilities save money and protect the environment by controlling leaks from natural gas pipelines. The program has identified seven "best management practices" for cost-effectively reducing methane emissions.

1997 Accomplishments

During 1997 Natural Gas STAR recruited seven new participants, bringing the total number to 70. The participants represent a majority of the natural gas industry, including 34 percent of natural gas production, 65 percent of transmission pipeline mileage, and 32 percent of all service connections.

As a group, all the Natural Gas STAR participants have reduced emissions of methane by an estimated 35 billion cubic feet (bcf) through 1997—the equivalent of removing more than 3 million cars from the road. Participants have gone beyond their original Natural Gas STAR commitment by identifying more than 90 "best management practices" that cost-effectively reduce methane emissions.

Natural Gas STAR's outreach efforts soared this year. A number of new tools that support implementation efforts were developed, including case studies, an implementation guide, decision support software, and a media guide.

NaturalGas
EPA POLLUTION PREVENTER

"We have made substantial methane emission reductions since signing on as a member of Natural Gas STAR. It has been a terrific way for us to improve our systems and save money."
JOHN WEUST, COORDINATOR
HEALTH, ENVIRONMENT AND SAFETY OPERATIONS SUPPORT GROUP
MARATHON OIL

What's Ahead

By the year 2000, Natural Gas STAR anticipates working with more than 300 participants to reduce methane emissions from 80 percent of the transmission and distribution sectors and 70 percent of all U.S. natural gas production. In 2000, Natural Gas STAR partners will save as much as 44 billion cubic feet of natural gas each year, enough to provide heat for 600,000 homes or the equivalent of removing 3.5 million cars from U.S. roads.

Natural Gas STAR Goals and Achievements

	1997 Goal	1997 Achievement	1998 Goal
Transmission Pipeline Miles (% in program)	70.0	65.0	80.0
Distribution Pipeline Miles (% in program)	40.0	32.0	45.0
Natural Gas Production (% in program)	40.0	37.0	50.0
Annual Gas Savings (bcf)*	9.1	10 (est.)	22.7

* Includes both CCAP program and base reductions.

AgSTAR

Who We Are

The AgSTAR Program works with dairy and pork producers to encourage manure management strategies that are both profitable and environmentally appropriate. The program provides tools, guidance, and methods that allow participating livestock producers to determine whether a biogas system is right for their farm. With these systems, producers can use methane recovered from their animal manures as an energy source. Not only do these projects reduce greenhouse gas emissions, but they enable producers to turn manure into a valuable asset that helps them remain competitive in today's livestock industry.

1997 Accomplishments

In 1997 methane recovery projects in many key livestock-producing states—including Illinois, Iowa, California, and Connecticut—made progress, advancing from groundbreaking to completion. At present, AgSTAR projects reduce the equivalent of approximately 10,000 metric tons of carbon from being released into the atmosphere.

In 1997 AgSTAR welcomed 10 new producer partners, bringing the total to 40 participants representing 4,400 livestock facilities. Participants are surveying their farms and installing methane recovery systems when it is cost-effective and environmentally beneficial to do so. Eighteen industry allies also joined the program this year, agreeing to promote cost-effective methods for reducing methane emissions.

In addition, two electric utilities joined the AgSTAR Program. Utilities play a significant role in the business of agriculture and keeping customers in a deregulated electric industry is becoming increasingly important to the utilities.

What's Ahead

AgSTAR estimates that methane recovery systems can be applied cost-effectively to nearly 2,000 swine and dairy farms in the United States. AgSTAR is targeting the participation of 500 farms by the year 2000. Reaching this goal would result in the production of approximately 50 megawatts of renewable energy.

Ruminant Livestock Efficiency Program

Who We Are

The Ruminant Livestock Efficiency Program (RLEP) promotes the adoption of management practices and improved technologies that reduce emissions of methane and other greenhouse gases from livestock production. Such practices include better grazing management, recordkeeping and business management; better genetics; production-enhancing technologies; and improved disease control.

1997 Accomplishments

During 1997 22 new farms joined RLEP, bringing the total to 44. These farms are demonstrating improved grazing management and other practices promoted by RLEP. In addition, RLEP began a pilot project to promote improved grazing management through workshops and technology transfer in the State of Virginia.

RLEP is developing targeted educational materials and providing technical assistance to participating farms.

What's Ahead

In 1998 RLEP will work aggressively in beef-producing areas, seeking partnerships with interested farms. The program will demonstrate ways to improve livestock efficiency and broaden its outreach efforts.

To promote better business practices, RLEP will conduct financial impact assessments on demonstration farms. The program will also develop new information tools on formulating business plans, so livestock producers can enhance their production efficiency and profitability.

RLEP will also initiate a comprehensive study of greenhouse gas impacts and interactions resulting from improved livestock management. The study will assess how RLEP practices can increase soil carbon content, reduce emissions of methane and nitric oxide, and reduce the production of carbon dioxide when fossil fuels are used to produce energy.

Agricultural Methane Programs* Goals and Achievements

	1997 Goal	1997 Achievement	1998 Goal
Partner Farms	150.0	418.0	250.0
Methane Reductions**	1.0	1.6	2.4

*Agricultural Methane Programs include AgSTAR and the Ruminant Livestock Efficiency Program.
**Includes both CCAP program and baseline reductions.

Industrial Environmental Stewardship Programs

Who We Are

APPD's environmental stewardship programs focus on reducing greenhouse gas emissions, particularly the industrial emissions of the most potent and long-lived greenhouse gases known, the perfluoroc-compounds (PFCs) and hydrofluorocarbons (HFCs). APPD works with U.S. aluminum, chemical, and semiconductor industries to examine opportunities for controlling and eliminating emissions. It also develops partnership programs to assist industry in implementing such technologies.

The VAIP [Voluntary Aluminum Partnership] allowed for a no regrets response to the potentially critical, but not clearly understood, issue of global warming. It is a practical program that offered the potential for a better approach to problem solving than ... possible solution by edict.

KAISER ALUMINUM CORPORATION

The environmental stewardship program for each industry has an emissions reduction goal for the year 2000. At present, these programs are well on their way to achieving their long-term goals.

Chemical Industry

The chemical industry has been tremendously successful in voluntarily reducing their greenhouse gas emissions by partnering with EPA. By implementing cost-effective measures to optimize the production of HCFC-22 and minimize the creation of HFC-23, the producers, have cut the overall amount of HFC-23 created during HCFC-22 production. The rate of HFC-23 generation per ton of HCFC-22 produced dropped by 25 percent between 1990 and 1996. Three million metric tons of carbon emissions (MMTCE) were not released into the environment as a result of these HFC-23 emission control efforts. These reductions were achieved in concert with economic and production growth.

Semiconductor Industry

Launched in 1996, EPA's partnership with the semiconductor industry will reduce emissions of perfluorocompounds (PFCs) from microchip fabrication. In 1997 the PFC Emissions Reduction Partner-ship for the Semiconductor Industry produced an inven-tory of perfluorocompound emissions from 24 participating manufacturers. These companies support extensive research into chemical substitutes, process optimization, recovery/recycling, and abatement technologies. The industry and EPA have helped develop similar programs in Japan, Europe, and Korea. The U.S.-based semiconductor industry and EPA are committed to protecting the earth's environment, while not jeopardizing the industry's position in the world market place.

Aluminum Industry

The Voluntary Aluminum Partnership (VAIP) is an innovative pollution prevention program developed jointly by the U.S. EPA and the primary aluminum industry, with the assistance of the U.S. Aluminum Association. Participating companies work with EPA to improve aluminum pro-duction efficiency while reducing perfluorocarbon (PFC) emissions. Since 1995 when VAIP was created, membership has grown to include 12 of the nation's 13 primary aluminum producers, representing 22 smelters and 94 percent of U.S. production capacity. The program's part-ners have committed their companies to the goal of reducing PFC emissions 40 percent from 1990 lev-els by 2000. If they meet this objective, roughly 2.2 million metric tons of carbon will not be relased into the air. As of 1997, it appears that the participants will reach their long-term goal.

Chemical Industry and Aluminum Industry Goals and Achievements

	1997 Goal	1997 Achievement	1998 Goal
MMTCE Reductions in Greenhouse Gas Emissions	2.3	4.4	3.5

Program Costs and Benefits

Based On Current and Projected Savings/Benefits

	Total Investments Completed by Partners			Total Investments Committed by Partners		
Program	Total Investment by Partners[1] (thousands)	Net Energy Bill Savings[2] (thousands)	MMTCE Reduction[3]	Additional Investment by Partners[4] (thousands)	Future Net Energy Bill Savings[5] (thousands)	Additional MMTCE Reduction[6]
Green Lights and ENERGY STAR Buildings	$1,737,566	$2,695,471	14.16	$2,415,141	$2,827,381	18.59
ENERGY STAR Office Equipment		$2,962,306	8.01		$9,569,636	25.90
ENERGY STAR Exit Signs	$44,064	$318,142	0.71			
ENERGY STAR Transformers	$6,999	$667	0.28	$8,852	$5,894	0.45
ENERGYSTAR Homes	$3,692	$6,873	0.02			
Landfill Methane Outreach[7]	$77,789	$47,208	2.62	$192,046	$234,363	9.38
Coalbed Methane Outreach	$43,760	$261,420	15.3			
Natural Gas STAR	$30,738	$223,320	15.35	$61,477	$334,046	22.96
AgSTAR	$3,750	$222	1.72	$12,500	$740	5.73
Chemical and Aluminum Industry			45.0			27.0
TOTAL	$1,948,358	$6,515,629	103.17	$2,690,016	$12,972,059	110.01

APPD 1991-1997 PROGRAM COSTS[8] (THOUSAND $): 191,830

APPD engaged Arthur Andersen, an independent public accounting firm, to perform certain agreed-upon procedures designed by APPD to assess the accuracy of APPD's calculations used to prepare the Statements of Program Costs and Benefits of the three largest APPD programs: the Green Lights, ENERGY STAR Office Equipment and Coalbed Methane Programs. This agreed upon procedures engagement was performed in accordance with standards established by the American Institute of Certified Public Accountants. Arthur Andersen's report on the results of these agreed-upon procedures is in the technical appendices.

Explanation of Program Costs and Benefits

1

Investment made or completed by Partners to the Green Lights, ENERGY STAR and Methane Programs prior to the end of 1997. These investments represent their capital expenditures made in order to meet their commitments under their Memorandum of Understanding with EPA. Since ENERGY STAR office equipment does not cost more than non energy efficient equipment, there are no investment costs associated with this Program. APPD's appendix to the Annual Report details the derivation of these investments.

2

Energy bill savings (Net Pre tax Savings) to Green Lights, ENERGY STAR, and Methane Partners and consumers who have either completed their upgrades to Green Lights or ENERGY STAR buildings, purchased ENERGY STAR Office Equipment, or made investments under the ENERGY STAR Methane and Transformers Programs by the end of 1997.

These energy bill savings (Net Pre tax Savings) are additional savings Partners or consumers receive due to their investments in Green Lights. ENERGY STAR, and Methane Program upgrades, projects or products, above those revenues they would have received had they invested in alternative projects. To determine this energy bill savings (Net Pre tax Savings), APPD first calculated the revenue received by the Partner or consumer due to energy savings for each year of upgrade, purchase of equipment, or duration of the project. APPD then determined the annual revenue to the Partner as if the Partner had invested the same funds in an alternative project that yielded the average rate of return of 10 percent for private sector projects or 4 percent for public sector projects over a similar length of time. (APPD used an opportunity cost of 8 percent for the ENERGY STAR Transformer Program.) To complete the calculation, APPD subtracted the alternative investment revenue from revenue generated due to Green Lights, ENERGY STAR, or Methane Programs in each year. APPD then added all annual energy bill savings (Net Pre tax Savings) to generate the total energy bill savings (Net Pre tax Savings) for these "completed" programs.

APPD used this approach to calculate energy bill savings (Net Pre tax Savings) to consumers for ENERGY STAR Office Equipment. Since energy bill savings (Net Pre tax Savings) represents savings to consumers for their purchase of ENERGY STAR Office Equipment, the alternative investment for consumers would be other non ENERGY STAR Office Equipment. However, since non ENERGY STAR Office Equipment has the same cost as ENERGY STAR Office Equipment, but none of the savings, there is no alternative investment revenue. Consequently, the energy bill savings (Net Pre tax Savings) to consumers due to the purchase of ENERGY STAR Office Equipment is simply the annual savings due to the use of that equipment.

APPD calculated energy bill savings (Net Pre tax Savings) over the lifetime of "completed" projects or purchases. These projects or purchases have lifetimes that extend from 4 to 15 years, accruing benefits through the year 2010. The total energy bill savings (Net Pre tax Savings) for completed projects or purchases under the Green Lights, ENERGY STAR, and Methane Programs therefore include savings that have not yet been realized by Partners or consumers. However, APPD believes that these savings will be realized since the investment or purchase has already been made. As for ENERGY STAR Homes, the life span of a home can be more than 100 years. However, various energy savings attributes, such as HVAC equipment or windows, will need to be replaced during this period. Since such an analysis can become complicated, APPD has only estimated energy bill savings (Net Pre tax Savings) over the first 30 years of an ENERGY STAR Home, the life of a conventional mortgage. This analysis assumes that the

HVAC equipment is replaced with ENERGY STAR HVAC equipment at the end of 15 years. If APPD had considered a 100 year period to determine savings, the energy bill savings (Net Pre tax Savings) would be more than three times greater. All future energy bill savings (Net Pre tax Savings) are in constant 1997 dollars.

These energy bill savings (Net Pre tax Savings) do not include financial benefits for partners who are recruited in the future, nor benefits for Partners or consumers who reinvest in their project once the current projects are depreciated, amortized, or retired.

APPD obtained investment costs for Green Lights and ENERGY STAR Programs from either industry reports submitted to APPD on their investments and savings, or from market penetration estimates obtained from industry surveys. However, the ENERGY STAR Methane Programs estimated investment costs, operation and maintenance costs, as well as revenue from industry models developed to determine the costs of specific methane programs.

The Appendix to the Annual Report describes in detail the calculation of the energy bill savings (Net Pre tax Savings) (Completed) for the Green Lights, ENERGY STAR, and Methane Programs.

3

Total Million Metric Tons of Carbon Equivalents (MMTCE) reduced due to the completed Green Lights and ENERGY STAR Programs as described in footnote 1 and 2. For programs that save electricity, APPD applied a factor that converts Kilowatt hours saved per year to MMTCEs. Similarly, for programs that reduce methane emissions, APPD applied a factor that converts billion cubic feet of methane reduced to MMTCE. The Appendix to the Annual Report describes these calculations in detail.

4

Level of investment to be made or committed to by Partners to the Green Lights, ENERGY STAR and Methane Programs prior to the end of 1997, i.e., their likely capital expenditures made to meet their commitments under their Memorandum of Understanding with EPA. All Coalbed Methane Partners and ENERGY STAR Homes Builders to date have completed their investments; there were no commitments pending at the end of 1997. Also, since ENERGY STAR Office Equipment does not cost more than non energy efficient equipment, there are no investment costs associated with this Program. APPD assumes additional investments in ENERGY STAR Exit Signs will be accounted for in ENERGY STAR Buildings. APPD's appendix to the Annual Report details the derivation of these investments.

5

Energy bill savings (Net Pre tax Savings) to Green Lights and ENERGY STAR Program Partners who have committed to either upgrade their commercial space or participate in the ENERGY STAR Methane Programs by signing a Memorandum of Understanding (MOU) to undertake these investments. APPD only included those Partners who have committed their participation in these programs by signing MOUs by the end of 1997. However, these Partners had not yet made capital investments, in comparison to those Partners who had already committed costs to these programs, as described in Footnote 1 and 2.

APPD calculated energy bill savings (Net Pre tax Savings) for committed projects similarly to energy bill savings (Net Pre tax Savings) for completed projects described under Footnote 2. Any savings from the ENERGY STAR Office Equipment Program is due to the purchase and use of this equipment.

Due to the significant market penetration of ENERGY STAR Equipment into the market place, the future benefits will be on the same order as the energy bill savings (Net Pre tax Savings) for "completed" ENERGY STAR Office Equipment.

For Green Lights, ENERGY STAR Buildings, and the ENERGY STAR Methane Programs, APPD determined the likely savings that result over the life of an upgrade or project. These upgrades or projects last from 10 to 15 years. For the ENERGY STAR Transformer Program, APPD has assumed that utilities maintain their MOU commitment to purchase a certain number of transformers for 1997 and 1998. With pending de regulation of the utility industry, APPD believes it appropriate to limit any projections to these years.

APPD assumes additional energy bill savings due to ENERGY STAR Exit Signs will be accounted for in ENERGY STAR Buildings.

The Appendix to the Annual Report describes the calculation of the energy bill savings (Net Pre tax Savings) (Committed) for the Green Lights, ENERGY STAR, and Methane Programs.

6

Total MMTCE reduced due to committed Green Lights and ENERGY STAR Programs as described in footnote 4 and 5. For programs that save electricity, APPD applied a factor that converts Kilowatt hours saved per year to MMTCEs. Similarly, for programs that reduce methane emissions, APPD applied a factor that converts billion cubic feet of methane reduced to MMTCE. APPD assumes additional carbon reductions due to ENERGY STAR Exit Signs will be accounted for in ENERGY STAR Buildings. The Appendix to the Annual Report describes these calculations in detail.

7

For the purpose of analysis, the projects in this program were divided into Gas and Electric projects. Furthermore, within those categories, the projects were divided into Rule and Non-Rule projects. Projects that fall into the Rule category are those which are located at landfills that are affected by EPA's New Source Performance Standards and Emissions Guidelines for landfills, and as such will be required to collect and combust their landfill gas. The first deadline date for landfills affected by the Rule is December 1998. Therefore, all methane reductions prior to December 1998 can be attributed to the Landfill Methane Outreach Program.

8

APPD expenditures dedicated to the development and operation of the Green Lights, ENERGY STAR, Methane Programs, and Industrial Programs from FY 1991 to the end of 1997. APPD dates the beginning of these programs to January 1, 1991 when the strategic plan for the Green Lights Program was first presented to the APPD Division. 1997 is the last completed fiscal year.

These costs include administrative costs such as office space rental, staff supplies, telecommunications and computer support, as well as programmatic costs such as grants, travel, contract support and staff salaries, including employee benefits, as well as costs for overhead support provided by other EPA offices in support of APPD's mission.

APPD obtained this information from EPA's Integrated Financial Management System as well as in internal records maintained by the Management Operations and Support Staff within APPD.

These costs reflect expenditures to support the Green Lights, ENERGY STAR, Methane and Utility, and Industrial Programs. However, APPD also expended funds to support other activities such as international climate change programs. Since these funds were not used to support the Green Lights, ENERGY STAR, and Methane Programs, APPD does not present these costs in this report.

For more detailed information on the program cost and benefits calculations, call APPD at (202) 564-9190.