ENERGY STAR

INVESTING IN OUR FUTURE

ENERGY STAR® and Other Voluntary Programs
2004 Annual Report

EPA

United States
Environmental Protection
Agency

INVESTING IN OUR FUTURE

ENERGY STAR® AND OTHER VOLUNTARY PROGRAMS
2004 ANNUAL REPORT

CONTENTS

For additional information, please visit our Web sites at www.epa.gov/cppd and www.energystar.gov or call the toll-free ENERGY STAR Hotline at 1-888-STAR-YES (1-888-782-7937).

LETTER FROM THE ADMINISTRATOR

September 2005

I am pleased to present this report on the accomplishments of ENERGY STAR and other voluntary programs at EPA. These exemplary results would not be possible without the commitment that our partners, many of whom are highlighted in this report, have toward protecting the climate and ensuring a cleaner, healthier environment for all Americans. The programs described in this report help Americans use energy more efficiently and save money on their energy bills. At a time when energy costs are at an all time high, these programs offer real solutions to people worried about heating and cooling their homes or running their businesses.

These partnership efforts are helping the United States to meet the President's goal of an 18 percent reduction in greenhouse gas intensity by 2012 through a broad set of strategies. Our partners are demonstrating that Americans will invest in energy efficiency when they have the right information on cost-effective choices for their homes and businesses. With our partners' help, ENERGY STAR continues to grow and encourage greater investment in energy efficiency. In 2004, Americans saved around $10 billion on their energy bills while preventing greenhouse gas emissions equivalent to those from 20 million vehicles.

Our ENERGY STAR and other voluntary program partners are increasing their investment in clean energy supply such as renewable energy and combined heat and power. EPA's Green Power Partnership now has 550 partners committed to purchasing more than 2 million megawatt hours of green power. In 2004 alone, over 300 new organizations joined the partnership, more than doubling the total number of Green Power partners.

The Climate Leaders program has welcomed a total of more than 60 leading companies of which more than 25 have publicly announced goals for aggressively reducing their greenhouse gas emissions.

EPA's partners have already significantly reduced emissions of methane and other powerful greenhouse gases. Methane emissions, in particular, are now 5 percent below 1990 levels and expected to remain below 1990 levels through 2020.

Year after year, these partners build on their environmental commitments. The past year was truly inspiring, and we commend our partners for volunteering to lead, innovate, and protect the environment for this and future generations.

I know from personal experience how easy it is to make ENERGY STAR part of your life at home. Each of us can make a difference in protecting our environment; when we all work together we can truly change the world.

Sincerely,

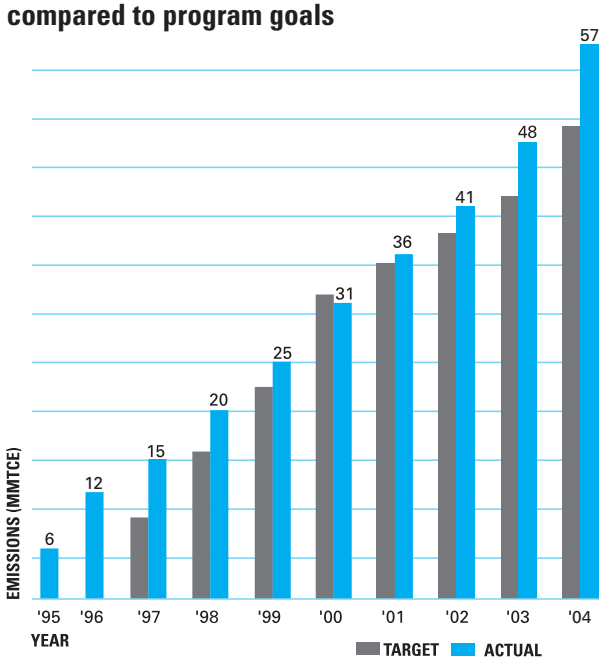
Stephen L. Johnson
Administrator
U.S. Environmental Protection Agency

EXECUTIVE SUMMARY

For more than a decade, the United States has made significant progress in reducing greenhouse gas emissions that contribute to global climate change. The comprehensive national climate change strategy implemented under President Bush continues to make progress in both the near and longer term by building on U.S. strengths in innovation and technology development. EPA's voluntary partnership programs are key elements of the near-term strategy that address market barriers, accelerate the adoption of proven technologies and practices, and deliver substantial emissions reductions.

A large and diverse set of partner organizations continues to avoid emissions of greenhouse gases and make significant progress toward meeting the President's goal for 2012. The year 2004 was another remarkable one for these efforts as demonstrated by the environmental and economic accomplishments presented in this annual report.

Figure ES-1.
Greenhouse gas emissions avoided compared to program goals



NOTE: Historical totals updated based on most recent data available.

Source: EPA Climate Protection Partnerships Division

HIGHLIGHTS OF 2004

- Americans, with the help of ENERGY STAR, prevented the greenhouse gas emissions equivalent to those from 20 million vehicles and saved around $10 billion on their energy bills.
- Since 2000, utility bill and greenhouse gas savings have doubled with the help of ENERGY STAR. Annual emissions reductions are on track to more than double again in 10 years from 20 to 40 million vehicle equivalents.
- The domestic methane programs exceeded their emissions reduction goals in 2004 and kept national methane emissions to well below 1990 levels.
- Renewable energy purchases grew to more than 2 billion kilowatt hours (kWh) among major companies, universities, government agencies, and other organizations as a strategy for demonstrating environmental leadership.
- The Administration's corporate leadership program, Climate Leaders, grew to 66 companies from many different industries, and about one-third of the companies completed sufficient work to announce aggressive greenhouse gas reduction targets for the future.
- Energy savings were about 125 billion kWh, or about 4 percent of the total 2004 U.S. electricity demand.

Additional environmental and economic achievements of EPA's climate partnerships[1] as of 2004 are summarized on the next page.

"These partnership efforts are helping the United States to meet the President's goal of an 18 percent reduction in greenhouse gas intensity by 2012 through a broad set of strategies. Our partners are demonstrating that Americans will invest in energy efficiency when they have the right information on cost-effective choices for their homes and businesses."

—Stephen L. Johnson, Administrator,
U.S. Environmental Protection Agency

EXECUTIVE SUMMARY

ENVIRONMENTAL BENEFITS

- The partnerships prevented 57 million metric tons (in MMTCE[2]) of greenhouse gas emissions in 2004, equivalent to the annual emissions from 38 million vehicles (see Figure ES-1).
- 50 MMTCE per year will be avoided during the next decade due to investments and actions already taken by partners in EPA's voluntary climate programs.

ECONOMIC BENEFITS

- Consumers and businesses have locked in investments in energy-efficient technologies exceeding $20 billion.
- Net of their investment in energy-efficient technologies, consumers and businesses are saving $115 billion cumulatively over the next 10 years; they saved about $10 billion in 2004 alone.

PROGRAM EFFECTIVENESS

Every federal dollar spent on these partnership programs through 2004 means:

- Reductions in greenhouse gas emissions of 1.0 metric ton of carbon equivalent (3.7 tons of carbon dioxide ($C0_2$).
- Savings for partners and consumers of more than $75 on their energy bills.
- The creation of more than $15 in private sector investment.
- The addition of more than $60 into the economy.

The environmental and economic benefits for key EPA partnership program areas—ENERGY STAR, Clean Energy Programs, Methane Programs, and the High Global Warming Potential (GWP) Gas Programs—are summarized in Table ES-1.

Table ES-1.
Summary of the benefits for 2004 and cumulative benefits through 2014 from the actions taken by partners through 2004 (in billions of 2004 dollars)

	BENEFITS FOR 2004		CUMULATIVE BENEFITS 1993–2014			
Program	Net Savings	MMTCE	NPV of Bill Savings	NPV of Technology Expenditures	NPV of Net Savings	MMTCE
ENERGY STAR						
Qualified Products	$5.1	13.0	$66.4	$4.6	$59.8	161
Buildings	$4.2	13.2	$63.5	$12.6	$50.9	170
Industry	___	4.1	___	___	___	69
Clean Energy Programs	___	1.7	___	na	___	19
Methane Programs	$0.3	12.9	$8.7	$4.5	$4.2	191
High GWP Gas Programs	___	11.7	___	na	___	181
TOTAL	$9.7	56.6	$136.7	$21.7	$115	791

NPV: Net Present Value

NOTES: Technology Expenditures include O&M expenses for Methane Programs.
Bill Savings and Net Savings include revenue from sales of methane and electricity.
ENERGY STAR qualified homes are included in the Qualified Products totals.
Totals may not equal sum of components due to independent rounding.
For details on cumulative benefits, see page 49.

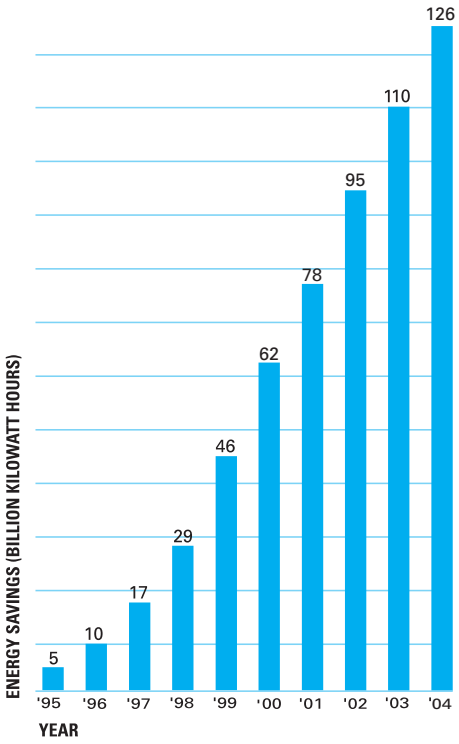
___ : Not applicable

na: Not available

[1] *This report provides results for the climate protection partnership programs operated by the Office of Atmospheric Programs at EPA. It does not include emissions reductions attributable to WasteWise, transportation programs, the Significant New Alternatives Program, or the landfill rule, which are the remaining actions in EPA's comprehensive climate program. EPA estimates the reduction in greenhouse gas emissions across the entire set of climate programs to be more than 80 MMTCE in 2004.*

[2] *Reductions in annual greenhouse gas emissions for EPA's climate programs, including non-CO_2 gases, are based on "carbon equivalents," which are determined by weighting the reductions in emissions of a gas by its global warming potential for a 100-year time period.*

Figure ES-2.
Annual savings in energy use as a result of EPA's partnership programs



NOTE: Historical totals updated based on most recent data available.

Source: EPA Climate Protection Partnerships Division

KEY ACCOMPLISHMENTS FOR 2004

ENERGY STAR

- Americans, with the help of ENERGY STAR, saved a significant amount of energy in 2004—126 billion kWh and 25 gigawatts (GW) of peak power, the amount of peak energy required for about 25 million homes (see Figure ES-2). They also prevented the greenhouse gas emissions equivalent to those from 20 million vehicles and saved around $10 billion on their energy bills (see Figure ES-3).
- Since 2000, awareness of the government's ENERGY STAR label has grown from 40 percent to more than 60 percent nationwide. In addition, 30 percent of U.S. households knowingly purchased an ENERGY STAR qualified product, and many say they would recommend ENERGY STAR to others.
- The ENERGY STAR label can be found on more than 40 different types of products. Participation has grown to over 1,400 manufacturers who use the ENERGY STAR across a total of 32,000 individual product models. In 2004, EPA introduced new specifications for air cleaners and vending machines and updated specifications for computer monitors.
- In the residential sector, over 360,000 ENERGY STAR qualified homes have been constructed by more than 2,500 builders to date, locking in savings of $200 million annually for homeowners.
- More than 11,000 homes have been improved through a new home retrofit program, Home Performance with ENERGY STAR. Home Performance with ENERGY STAR is growing as states and utilities look for additional opportunities to achieve energy savings and reduce peak loads.
- In the commercial sector, about 21,000 buildings representing more than 3.5 billion square feet (or 12 percent of the total eligible market) have now been rated for energy performance, including 34% of hospitals, 22% of office buildings, 21% of supermarkets, 13% of schools, and 9% of hotels.
- EPA also launched a new recognition effort—ENERGY STAR Leaders—to honor partners that achieve energy efficiency improvements of 10, 20, or 30 points across their building portfolio and recognized 18 organizations as ENERGY STAR Leaders in October 2004.
- In the industrial sector, EPA continued to convene Industry Focuses to develop key energy management tools and improve energy efficiency in the automobile, corn refining, brewing, cement, pharmaceutical, and petroleum industries.

Clean Energy

- The Combined Heat and Power (CHP) Partnership has grown to 145 partners since first introduced in 2001 and facilitated 32 new CHP projects, totaling 1,260 MWe[3] of new CHP capacity.
- Since the program's launch in 2001, the number of Green Power partners has increased to 549 organizations, which have made a combined commitment to purchase more than 2 million megawatt hours (MWh) of green power annually, including 1.6 million MWh from new renewable energy resources.

[3] *Measured at the generator terminals.*

State and Local Government Programs

- EPA developed the Clean Energy-Environmental State Partnership Program, a new voluntary initiative which encourages state officials to develop and implement comprehensive clean energy strategies that will lead to public health and economic benefits.
- EPA worked with states and communities to estimate the air quality benefits of energy efficiency and renewable energy measures and incorporate the measures into their State Implementation Plans (SIPs).
- EPA provided states with analytic support to help estimate the macroeconomic impact of energy efficiency and renewable energy policies. The states discovered that they could achieve significant reductions in fossil fuel energy use and emissions while promoting clean energy, creating jobs, and saving money.

Methane and High Global Warming Potential (GWP) Gas Programs

- The reduction of non-carbon dioxide gases—methane, PFCs, HFCs, and SF_6—totaled more than 24 MMTCE in 2004 as a result of EPA's partnership programs. These voluntary partnerships, in conjunction with a regulatory program to limit air emissions from the nation's largest landfills, kept national methane emissions to well below 1990 levels, and they are projected to remain below 1990 levels through 2012.
- Public-private industry partnerships are substantially reducing U.S. emissions of the high GWP gases released as byproducts of industrial operations and are expected to maintain high GWP gas emissions substantially below 1990 levels through 2012.

EXPECTATIONS FOR 2005 AND BEYOND

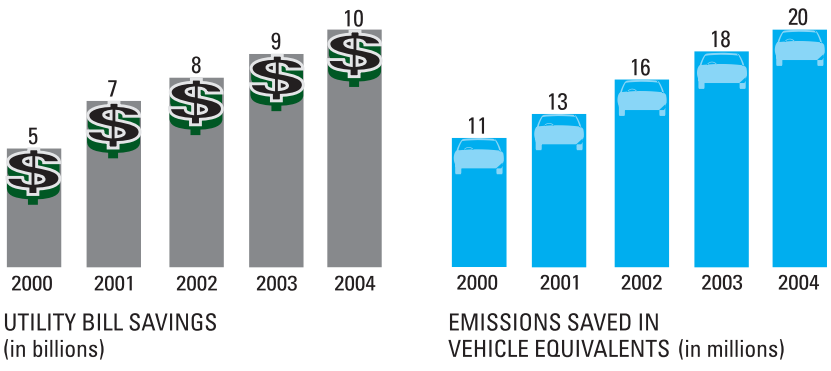
The efforts of EPA and its partners are expected to deliver a significant portion of the emissions reductions required to meet the nation's greenhouse gas intensity reduction goal for 2012. In the coming years, expanding programs and partnerships with strong foundations will continue to offer increasing benefits to businesses, organizations, and consumers while promoting environmental stewardship (see Figure ES-4).

For 2005 and beyond, EPA plans to:

ENERGY STAR

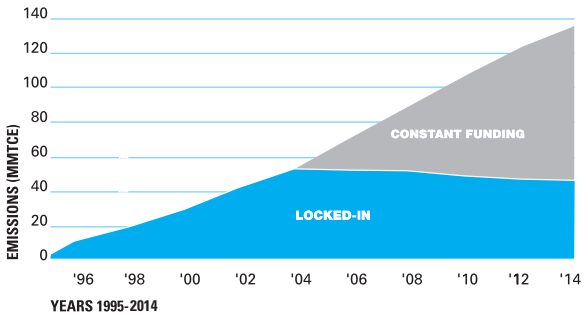
- Add new products to the ENERGY STAR family where significant energy savings are possible, including external power supplies (cordless phone or cell phone chargers, for example) and battery chargers; and update energy efficiency specifications for more products, including televisions, dehumidifiers, telephony, air conditioners, heat pumps, and light fixtures.
- Continue to build consumer awareness of ENERGY STAR. The goal is to raise awareness of the ENERGY STAR label as a credible symbol for energy efficiency and environmental protection to more than 70 percent over the next several years.
- Work with the U.S. Department of Energy (DOE), manufacturers, retailers, home builders and raters, utilities, and states in broad consumer promotions of ENERGY STAR qualified products and new homes. In 2005, EPA expects 175 million ENERGY STAR qualified products to be sold and 170,000 new ENERGY STAR homes to be constructed.
- Increase the stringency of the specification for ENERGY STAR qualified new homes to be fully implemented by the end of 2006. For the first time, EPA's new home specification includes ENERGY STAR qualified products.
- Pilot an Indoor Air Quality (IAQ) specification paired with the ENERGY STAR specification for new homes. The IAQ specification will address moisture control, radon, pest control, HVAC, combustion safety, building materials, and commissioning.

Figure ES-3.
Since 2000, ENERGY STAR savings have nearly doubled



Source: EPA Climate Protection Partnerships Division

Figure ES-4.
Annual greenhouse gas emissions avoided can be more than doubled by 2012



NOTE: Historical totals updated based on most recent data available.
Source: EPA Climate Protection Partnerships Division

- Continue to expand Home Performance with ENERGY STAR nationally by assisting the contractor accreditation and technician certification program of the Building Performance Institute. EPA expects that more than 21,000 whole house retrofits will be completed by the end of 2005.
- Launch a new ENERGY STAR Challenge–*Building a Better World 10% at a Time* to spur commercial building improvements. In coordination with key associations and states, the Challenge calls on U.S. businesses and institutions to reduce energy use by 10 percent or more; and EPA recognizes organizations that improve the energy performance of their building portfolio by 10, 20, 30 points or more as ENERGY STAR Leaders for demonstrating superior energy management.
- Update the energy performance rating system with the latest Energy Information Administration and state survey data and expand it to include more building types.
- Convene Industry Focuses and develop Energy Performance Indicator tools with the pharmaceutical, automobile manufacturing, brewing, cement, petroleum, and corn refining industries.

Climate Leaders

- Attract 20 additional business partners and add 20 companies to the list of Climate Leaders with publicly stated corporate greenhouse gas emissions reduction goals.

Clean Energy

- Assist partners in the Combined Heat and Power Partnership (CHP) with more than 30 new CHP projects, facilitating the development of over 800 MWe of new CHP capacity.
- Engage more than 800 Green Power partners and increase green power purchasing commitments to a total of 2.5 million MWh annually.

State and Local Government Programs

- Launch the new Clean Energy-Environment State Partnership Program, designed to help states adopt clean energy policies and deploy programs that will reduce greenhouse gas emissions, save energy, promote reliable and affordable electricity generation, and increase economic development in the states.
- Help up to 15 states develop Clean Energy-Environment Action Plans.
- Release the *Clean Energy and Environment Guide to Action* that will help states take advantage of the environmental and economic benefits that clean energy offers.
- Continue to provide state and local officials and their national associations with technical assistance, tools, and outreach to promote the environmental, public health, energy, and economic benefits of reducing energy use. Provide six or more states with hands-on assistance to facilitate the progress of clean energy policies and programs.

Methane and High Global Warming Potential (GWP) Gas Programs

- Aggressively work with existing partner companies to expand the methane emissions reduction projects within their companies and maintain overall methane emissions below 1990 levels.
- Continue implementing agreements to reduce greenhouse gas intensity for the aluminum, magnesium, and semiconductor sectors as part of the Climate VISION initiative.
- Continue to support the Improved Mobile Air Conditioning (I-MAC) 30/50 project to reduce air conditioning fuel consumption by at least 30 percent and cut refrigerant emissions by 50 percent.

INTRODUCTION

For more than a decade, the United States has made significant progress in reducing greenhouse gas emissions that contribute to global climate change. President Bush announced an aggressive strategy in 2002 to reduce the nation's greenhouse gas intensity by 18 percent by 2012.[4] The Administration is strengthening and expanding EPA's voluntary programs as a key strategy for achieving the intensity reduction goal. EPA's voluntary partnership programs address market barriers, accelerate the adoption of proven technologies and practices, and deliver substantial emissions reductions.

EPA's voluntary efforts advance a broad set of practices and technologies that significantly reduce emissions of the major greenhouse gases from key sources. The partnership programs:

- Span the major sectors of the U.S. economy, encompassing generation and use of energy in the commercial, residential, industrial, and transportation sectors (see Figure 5).
- Address the most potent of greenhouse gases emitted from industrial processes and waste management.
- Engage and challenge businesses, public institutions, and households to reduce their greenhouse gas emissions through investments in energy efficiency, renewable energy, and other climate friendly technologies.
- Provide objective information, technical assistance, and recognition for environmental leadership to organizations that are taking measurable steps to reduce their greenhouse gas emissions.

With sustained efforts, EPA and its partners will deliver a significant portion of the emissions reductions required to meet the President's goal for 2012. Established programs have already demonstrated that significant accomplishments can be achieved with well-designed partnership programs. The year 2004 was another remarkable one for EPA's voluntary climate programs as demonstrated by the environmental and economic accomplishments presented in this annual report.

EPA's public-private partnerships focus on the following opportunities to stimulate action:

Energy Efficiency. EPA has encouraged greater investment in energy efficiency where cost effective since the early 1990s through the ENERGY STAR program. Energy efficiency—obtaining the identical services or output such as heating, cooling, and lighting for less energy input—provides the following benefits:

- Addresses the growing emissions of carbon dioxide (CO_2) from energy generation and use, which represent 85 percent of U.S. greenhouse gas emissions (see Figure 5).
- Offers significant cost savings to businesses, public institutions, and consumers as many households, businesses, and public institutions can save 20 to 30 percent on their energy bills by making cost-effective investments in energy-efficient products and services.
- Provides a low-cost resource for improving electricity reliability.
- Helps reduce demand for natural gas and lower natural gas prices.

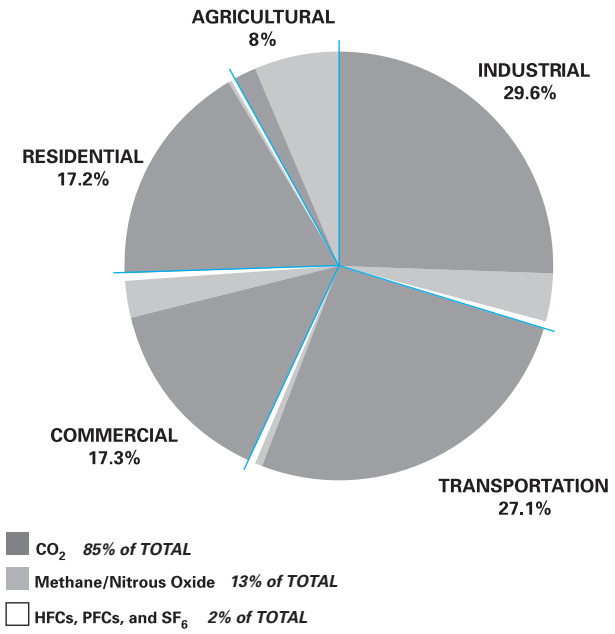
The ENERGY STAR program has grown into a broad partnership with manufacturers, retailers, home builders, utilities, states, and others helping businesses, public institutions, and households invest in energy efficiency.

"Our partnership with ENERGY STAR has been one of the cornerstones of our very successful New York Energy $mart Program. Our market transformation efforts have been successful with retailers and consumers because of our close association with ENERGY STAR, and its message of quality, value, and environmental protection."

—Tom Collins, Director of Communications,
New York State Energy Research and Development Authority

[4] *Greenhouse gas intensity is the ratio of greenhouse gas emissions to economic output (measured by the gross domestic product). For more information on the Administration's goal, see http://www.whitehouse.gov/news/releases/2002/02/climatechange.html.*

Figure 5.
U.S. greenhouse gas emissions by sector and by gas



NOTE: Totals may not add to 100% due to independent rounding.

Source: EPA GHG Inventory 2005

Clean Energy Supply. EPA is collaborating with its partners to lower transaction costs and expand the use of technologies that significantly reduce the greenhouse gas emissions from energy generation. In fulfillment of the National Energy Policy, EPA is promoting combined heat and power as well as the purchase of renewable sources of energy so that these technologies can play larger roles in the U.S. energy mix.

Corporate Commitments. EPA has offered leading organizations the opportunity to be Climate Leaders since 2002. The Climate Leaders partners take aggressive steps to reduce their impacts on the global environment. They inventory their greenhouse gas emissions, set aggressive long-term reduction goals, report their progress to EPA, and receive recognition for their achievements. Climate Leaders partners are playing an important part in helping the country reach its greenhouse gas intensity reduction goal of 18 percent by 2012.

State and Local Clean Energy Programs. EPA is providing technical assistance to state agencies to help them assess the environmental and economic benefits of clean energy policies and programs, including those that advance energy efficiency, combined heat and power, and renewable sources of energy.

Methane Programs. Methane is not only a potent greenhouse gas, but is also a much sought-after clean fuel. When methane emissions can be captured, the recovered methane represents a valuable energy source that can be used or sold. The natural gas, coal, and landfill gas development industries are working with EPA through partnership and outreach programs to capture and use methane wherever cost effective.

High GWP Gas Programs. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are potent greenhouse gases, meaning they have a greater ability to trap heat in the Earth's atmosphere on a molecule per molecule basis relative to CO_2 (see Table 2); and some of these gases persist in the environment for thousands of years. Various U.S. industries are working with EPA to avoid significant accumulation of long-lived chemicals in the atmosphere. These voluntary programs accelerate the development and implementation of low-emitting technologies and help companies use alternative chemicals where technically feasible and cost effective.

Table 2.
Global warming potentials (GWPs) and atmospheric lifetimes of greenhouse gases

Greenhouse Gas	Global Warming Potential for 100 Years	Atmospheric Lifetime (years)
Carbon Dioxide	1	50 – 200
Methane	21	12 ± 3
Nitrous Oxide	310	120
Hydrofluorocarbons	140 – 11,700	1.5 – 264
Perfluorocarbons	6,500 – 9,200	3,200 – 50,000
Sulfur Hexafluoride	23,900	3,200

Source: IPCC 1996

The results from these partnership efforts have been steady and strong for over a decade, and 2004 was another extraordinary year. This 2004 Annual Report provides detailed information on each of the program areas listed above, including program overviews, environmental and economic benefits for 2004, and goals for the future.

ENERGY STAR SINCE 2000

The ENERGY STAR Program has been substantially expanded since the end of 2000. Important program efforts include:

Adding more than 10 new products to the ENERGY STAR family, with more under development.

- Air cleaners
- Ceiling fans
- Commercial coin-op washing machines*
- Commercial cooking equipment
- Commercial solid door refrigerators and freezers
- Refrigerated vending machines
- Set top boxes
- Small commercial heating and cooling equipment
- Telephony (cordless phones, answering machines)
- Ventilation fans

**DOE managed products*

Updating ENERGY STAR specifications to more efficient levels for more than 15 products, with more underway.

- Audio/DVD
- Ceiling fans
- Clothes washers*
- Compact fluorescent lights*
- Computer monitors
- Dishwashers*
- Exit signs
- Freezers and compact refrigerators*
- Light commercial A/C and air source heat pumps
- Refrigerators*
- Residential light fixtures
- Residential central air conditioners and air source heat pumps
- Telephony
- TV/VCRs
- Ventilation fans
- Windows*

Expanding EPA's national building energy performance rating system—through which buildings can be rated on a scale of 1 to 100 and earn the ENERGY STAR for top performance—to more than eight new building types.

- Acute care hospitals
- Bank branches
- Courthouses
- Financial centers
- Hotels
- Medical offices
- Residence halls
- Supermarkets and grocery stores
- Warehouses

Adding commercial new construction (Designed to Earn the ENERGY STAR).

Expanding the ENERGY STAR program into the industrial sector through targeted partnerships with the auto manufacturing, cement, corn refining, petroleum, and pharmaceutical industries.

ENERGY STAR KEY PROGRAM INDICATORS

	INDICATOR	2000	2004
QUALIFIED PRODUCTS	Products Sold **	600 million	1.5 billion
	Product Categories	33	45
	Product Models	11,000	32,000
	Public Awareness	40%	Over 60%
	Retailers	25	550
NEW HOMES	New Homes Built **	25,000	360,000
	Home Builders	1,600	2,500
COMMERCIAL BUILDINGS	Buildings Benchmarked **	4,200	21,000
	Buildings Labeled **	545	2,000
	Building Types	2	11
INDUSTRIAL IMPROVEMENTS	Industry Focuses	0	6
ANNUAL RESULTS	Energy Saved (kWh)	62 billion	126 billion
	Avoided Emissions (MMTCE)	15.8	30.3
	Net Savings (2004 $s)	$5 billion	$10 billion

*** Results are cumulative.*

ENERGY STAR PROGRAM

There is large potential for cost-effective energy efficiency that is not being fully realized in businesses and households across the United States due to the number of informational, institutional, and practical obstacles that hinder greater investment. For example, while businesses and homeowners may express interest in energy-efficient improvements for their buildings or homes, they do not always know which products or services to ask for, who supplies them in their areas, and whether the real energy savings will live up to the claims. There may also be a lack of incentive for builders or building owners who do not usually pay the energy bill and, therefore, may equip buildings at the lowest cost with less efficient products.

The ENERGY STAR program seeks to overcome many of these market barriers and enable businesses, organizations, and consumers to realize the cost savings and environmental benefits of energy efficiency investments. The ENERGY STAR program employs the following strategies:

- Uses the government-backed ENERGY STAR label to clearly identify the products, practices, services, new homes, and buildings that meet government guidelines for energy efficiency—offering lower energy bills and environmental benefits.
- Empowers decisionmakers by making them aware of the benefits of products, homes, and buildings that qualify as ENERGY STAR, by providing easy to use assessment tools, and by providing project guidelines for efficiency improvements.
- Works with retailers, service providers, and others in the delivery chain to offer energy-efficient products and services.
- Partners with regional, state, and local organizations running energy efficiency programs to take advantage of growing public awareness of ENERGY STAR and achieve greater energy efficiency in the residential and commercial sectors with combined resources.

Introduced by EPA in 1992 for energy-efficient computers, the ENERGY STAR program has become a broad platform for energy efficiency across the residential, commercial, and industrial sectors. The program has grown to include:

- Efficient new homes that became eligible for the ENERGY STAR label in 1995.
- Corporate management approaches for improving the energy performance of commercial buildings, which became a core ENERGY STAR strategy (building upon Green Lights) starting in 1995.
- More than 40 product categories for homes and businesses.

"With ENERGY STAR, Lowe's partners with our employees and customers to help improve the environment through reduced pollution and decreased reliance on energy. Through our training and educational efforts, we help make the connection between energy use and the environment, which last year led to sales of over 5 million ENERGY STAR qualified products—saving our customers more than $58 million in energy costs and reducing carbon emissions equivalent to planting nearly 116,000 acres of trees."

—Michael Chenard, Director Environmental & Government Affairs, Lowe's Companies, Inc.

- Collaboration with DOE which assumed responsibility for certain product categories in 1996.
- A new national energy performance rating system for office buildings—similar to the miles per gallon rating for vehicles—which was introduced in 1999 and now applies to building types such as schools, hospitals, hotels, and grocery stores, among others.
- Approaches for energy management and efficiency improvements in the industrial sector since 2001, when EPA integrated the Climate Wise program into ENERGY STAR.
- Residential home improvement services that offer solutions beyond product purchases with the 2001 launch of ENERGY STAR Home Sealing and the whole house home improvement effort called Home Performance with ENERGY STAR.

The economic and environmental benefits of ENERGY STAR through the year 2004 are substantial. More than 1.5 billion ENERGY STAR qualified products have been purchased, more than 360,000 ENERGY STAR qualified new homes are in place, and billions of square feet of building space have been improved. Americans, with the help of ENERGY STAR, have saved about 125 billion kilowatt hours of energy, or about 4 percent of the total 2004 electricity demand, as shown in Table 3. They have prevented 30 million metric tons of greenhouse gas emissions, saved about $10 billion on their utility bills, and helped avoid 25 GW of peak power. These benefits have doubled since 2000 as EPA and DOE have continued to expand and refine the program in important ways (see page 9).

Additional program achievements within the residential, commercial, and industrial sectors are presented in the following sections.

Table 3.
ENERGY STAR Program: Annual Goals and Achievements

	2004				2005	
	Energy Saved (Billion kWh)		Emissions Prevented (MMTCE)		Energy Saved (Billion kWh)	Emissions Prevented (MMTCE)
	Goal	Achieved	Goal	Achieved	Goal	Goal
PROGRAM TOTAL FOR ENERGY STAR	99.5	125.8[1]	24.8	30.3	116.8	27.3
Qualified Products and Homes[2]	—	61.2	11.9	12.8	—	13.3
Residential Products	—	24.9	—	5.6	—	—
Consumer Electronics[3]	—	7.5	—	1.5	—	—
Residential Appliances[4]	—	0.2	—	0.0	—	—
Residential Office Equipment	—	9.4	—	1.9	—	—
Lighting	—	5.3	—	1.1	—	—
Heating and Cooling	—	2.6	—	1.1	—	—
Commercial Products	—	35.6	—	7.2	—	—
Commercial Appliances	—	0.6	—	0.1	—	—
Office Equipment	—	33.7	—	6.8	—	—
Commercial Lighting	—	1.2	—	0.2	—	—
Other	—	0.1	—	0.0	—	—
New Homes	—	0.7	—	0.2	—	—
Commercial Building Improvements[5]	—	64.6	9.5	13.2	—	10.5
Industrial Improvements[6]	—	—	3.4	4.1	—	3.5

[1] *The kWh savings imply peak demand savings of more than 25 gigawatts (GW), based on conservation load factors developed by LBNL (Koomey et al., 1990).*
[2] *Results for qualified products from Webber et al., 2005.*
[3] *A small portion of consumer electronics may be used in commercial buildings such as hotels. For reporting purposes, all consumer electronics results are included under Residential Products.*
[4] *EPA results only, does not include products under the responsibility of DOE.*
[5] *Results from building improvements based on methodology presented in Horowitz, 2004.*
[6] *Results from industrial improvements from ICF Consulting, 2005.*

Totals may not equal sum of components due to independent rounding.
— : Not applicable

ENERGY STAR PSA SHOWS HOW TO PROTECT THE ENVIRONMENT RIGHT FROM HOME

EPA launched a new public service announcement (PSA) campaign in May 2004 encouraging the public to look for the ENERGY STAR to help prevent the air emissions created when electricity is generated for home use. The campaign uses humor to make the point that the energy used in a home may cause twice the greenhouse gas emissions of a vehicle.

The TV PSA shows the value and ease of looking for the ENERGY STAR to find qualified products and get home improvement tips, which will reduce the amount of energy needed for a home. The comprehensive campaign, which includes TV, radio, and print PSAs in English and Spanish, encourages consumers to visit www.energystar.gov to discover five steps to protect the environment right from home. If every household followed just one of these steps—replacing their five most frequently used lights with ENERGY STAR qualified ones—that would prevent more than one trillion pounds of greenhouse gas emissions.

EPA ENCOURAGES HOMEOWNERS TO TAKE THESE FIVE STEPS TO PROTECT THE ENVIRONMENT:

1. **Change five lights**
   Replace the five most frequently used lights, or the bulbs in them, with ones that have earned the ENERGY STAR to save energy and prevent emissions.

2. **Look for products that have earned the ENERGY STAR**
   When shopping for lighting, home electronics, heating and cooling equipment, and appliances, choose ENERGY STAR qualified products.

3. **Heat and cool smartly**
   Improve the home's performance by servicing equipment annually, using programmable thermostats, and replacing old equipment with ENERGY STAR models.

4. **Seal up the house**
   Seal air leaks around drafty windows and doors, add insulation to attics, and buy ENERGY STAR windows when replacing older ones to improve comfort in your home and save energy.

5. **Tell family and friends**
   Help spread the word that energy efficiency is important—it benefits your home, lowers your utility bills, and makes a difference in your environment.

Energy savings from ENERGY STAR qualified products and homes add up to cleaner air and lower energy bills for American consumers. And, as the ENERGY STAR PSA campaign points out, saving energy every day right from home is an easy step for anyone to take.

ENERGY STAR in the Residential Sector

Homes continue to provide a sizeable opportunity for protecting the environment through energy efficiency. The energy used in a typical home can cause twice as many greenhouse gas emissions as operating a vehicle for one year. That energy costs about $1,500 per year. By looking to ENERGY STAR for greater efficiency, households are saving up to $450 annually on utility bills and significantly reducing their emissions of greenhouse gases. Whether buying a product for the home, making home improvements, or buying a new home, consumers can rely on ENERGY STAR to guide their investment decisions, save them money, and contribute to a better environment. Residential sector highlights for 2004 include:

More ENERGY STAR qualifying products. More ENERGY STAR qualified products joined the family this past year as EPA introduced new ENERGY STAR specifications for air cleaners (in addition to products in the commercial sector), and completed the work necessary to qualify external power supplies for the ENERGY STAR, which will be announced in early 2005. In addition, EPA undertook efforts to update energy efficiency specifications for products in cases where technology had advanced and updates were necessary to maintain the value of ENERGY STAR. EPA updated the specification for computer monitors; and, for the first time, it addresses energy consumption while monitors are in use, as well as when they are idle. By the end of 2004, Americans could choose energy-saving products from more than 40 categories to use in their homes. These products offer consumers savings of between 10 and 90 percent relative to standard models and up to 30 percent savings in total on their energy bills. More than 1,400 manufacturers are using the label on more than 32,000 qualifying product models.

CHANGE FOR THE BETTER WITH ENERGY STAR

PARTNER OF THE YEAR 2004

NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY

Albany, New York

The New York State Energy Research and Development Authority (NYSERDA) has achieved tremendous success leveraging the ENERGY STAR platform across many program areas, demonstrating an organization-wide commitment. As a result, EPA recognized NYSERDA as the winner of the Corporate Commitment award in 2004, making it only the fourth organization and the first public entity to earn the award. Since the program's inception in 1999, the market share of ENERGY STAR qualifying appliances, room air conditioners, and lighting fixtures has risen by more than 100 percent. NYSERDA also leads the nation in the market for home improvement through Home Performance with ENERGY STAR, which encourages homeowners and contractors to identify and implement a complete set of cost-effective improvements when retrofitting homes. The program has helped create more than 6,400 jobs and saved homeowners $3.5 million in 2004. NYSERDA's ENERGY STAR labeled homes program, launched in 2001, helped promote the construction of 2,500 ENERGY STAR labeled homes statewide in 2004, more than doubling the program total in one year alone. NYSERDA is helping state agencies use EPA's energy performance rating to identify good candidates for building improvements. Already, more than 25 percent of state buildings are tapping into ENERGY STAR. Across New York, NYSERDA is assisting public school districts by using ENERGY STAR to elevate energy priorities, develop effective school improvement plans, and attain ENERGY STAR Leader designations based on their savings. ***(For a complete list of ENERGY STAR Award Winners for 2004, see page 26.)***

"Our ongoing relationship with ENERGY STAR has been a most rewarding journey. We, at Ence Homes, can attribute a great amount of our success to the ENERGY STAR program. Our mission statement reflects our sincere commitment: Providing Prompt, Courteous Customer Service While Building Quality, Innovative and Energy Efficient Homes."

—Kim Ence, President, Ence Homes

Growing awareness. The ENERGY STAR label is now recognized by more than 60 percent of the American public, up from 40 percent in 2001. In addition, consumers increasingly trust ENERGY STAR when making purchasing decisions. A majority of consumers report that the label influenced their purchasing decisions, and more than 70 percent of those who purchased an ENERGY STAR product would recommend ENERGY STAR to a friend (CEE Household, 2005). The ENERGY STAR label ranks among the highest level of influence on product purchases among all consumer emblems, similar in ranking to the Good Housekeeping Seal and Consumer Reports (Fairfield Research, 2003). Some of the growth in awareness is the result of a series of national public awareness campaigns developed by EPA. The most recent campaign launched in the summer of 2004 (see page 12) offers practical advice to consumers on what they can do to reduce greenhouse gas emissions. The campaign has garnered more than $5.5 million in equivalent ad value through print, radio, and television placements through the end of 2004 and continues to run.

Nearly 10 percent of the nation's new homes earned the ENERGY STAR. Homes that earn the ENERGY STAR provide comfort, value, and savings to homeowners and increased profits to home builders, while protecting the environment. In 2004, nearly 10 percent of the nation's housing starts were ENERGY STAR qualified homes, and by the end of the year, more than 360,000 homes had earned the ENERGY STAR, saving Americans more than $200 million in energy costs annually. Recent growth in the number of qualified new homes has been exceptional, with a doubling in each of the past 3 years. Now in many major markets, prospective home buyers can easily find an ENERGY STAR qualified home because local builders are constructing 20 percent or more of their new homes as ENERGY STAR. These markets include Phoenix, Las Vegas, Southern California, and parts of Texas. New Jersey, New England, and the Midwest also have large concentrations of ENERGY STAR qualified homes. Recognizing the value of offering ENERGY STAR qualifying homes, some 2,500 builder partners have joined ENERGY STAR, including the nation's 10 largest home builders, 23 of the top 25 builders, and nearly 50 percent of the top 100 builders (*Builder Magazine,* 2003).

Beyond products with ENERGY STAR Home Improvement. EPA continued to work to help homeowners make home improvements by promoting contractor services that improve the efficiency and comfort of their homes, as well as do-it-yourself steps homeowners can take to improve their homes. EPA, working with DOE, the U.S. Department of Housing and Urban Development (HUD), and regional sponsors, promoted the whole house improvement program called Home Performance with ENERGY STAR. This program emphasizes whole house diagnostics, provides for improvements made by trained, credentialed technicians to

CHANGE FOR THE BETTER WITH ENERGY STAR

PARTNER OF THE YEAR 2004

CENTERPOINT ENERGY

Houston, Texas

CenterPoint Energy is successfully building consumer awareness and demand for ENERGY STAR qualified homes, while also increasing the building industry's willingness and ability to construct ENERGY STAR qualified homes around Houston. Since its inception 4 years ago, the program has worked closely with consumers, realtors, and builders to ensure that they understand the value associated with ENERGY STAR qualified homes. The number of qualified homes in CenterPoint's program grew to more than 13,000 in 2004. Exemplary efforts in 2004 include CenterPoint's extensive outreach campaign highlighting the value of ENERGY STAR. In addition, CenterPoint's realtor outreach included co-sponsoring a continuing education course for Houston realtors that explains the value of ENERGY STAR to assist them in selling new homes. CenterPoint also regularly conducts training for and reaches out to builder sales staffs and home energy raters. ***(For a complete list of ENERGY STAR Award Winners for 2004, see page 26.)***

ENERGY STAR PROGRAM

ENERGY STAR PRODUCT CATEGORIES

Appliances
Clothes Washers*
Dishwashers*
Refrigerators & Freezers*

Heating & Cooling
Air-source Heat Pumps
Boilers
Central AC
Ceiling Fans
Dehumidifiers
Furnaces
Geothermal Heat Pumps
Home Sealing (Insulation)
Light Commercial HVAC
Programmable Thermostats
Room AC*
Ventilating Fans

**DOE managed products*

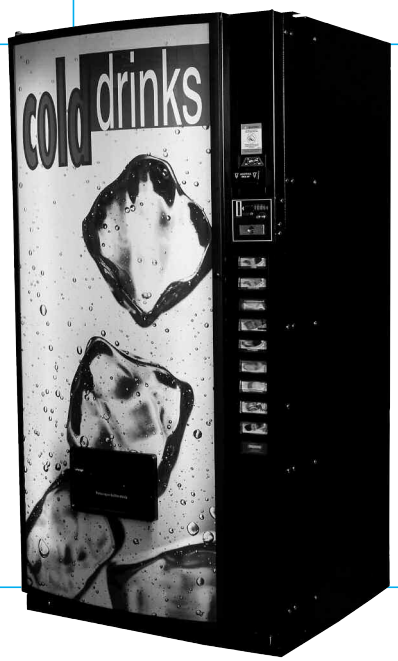
Home Electronics
Cordless Phones
Combination Units
DVD Products
Home Audio
Televisions
VCRs

Office Equipment
Computers
Copiers
Fax Machines
Laptops
Mailing Machines
Monitors
Multifunction Devices
Printers
Scanners

Commercial Food Service
Commercial Fryers
Commercial Hot Food Holding Cabinets
Commercial Solid Door Refrigerators & Freezers
Commercial Steam Cookers

Lighting
Ceiling Fans with CFLs
Compact Fluorescent Light Bulbs (CFLs)*
Exit Signs
Residential Light Fixtures
Traffic Signals

Other
Roof Products
Room Air Cleaners
Transformers
Vending Machines
Water Coolers
Windows, Doors, & Skylights*

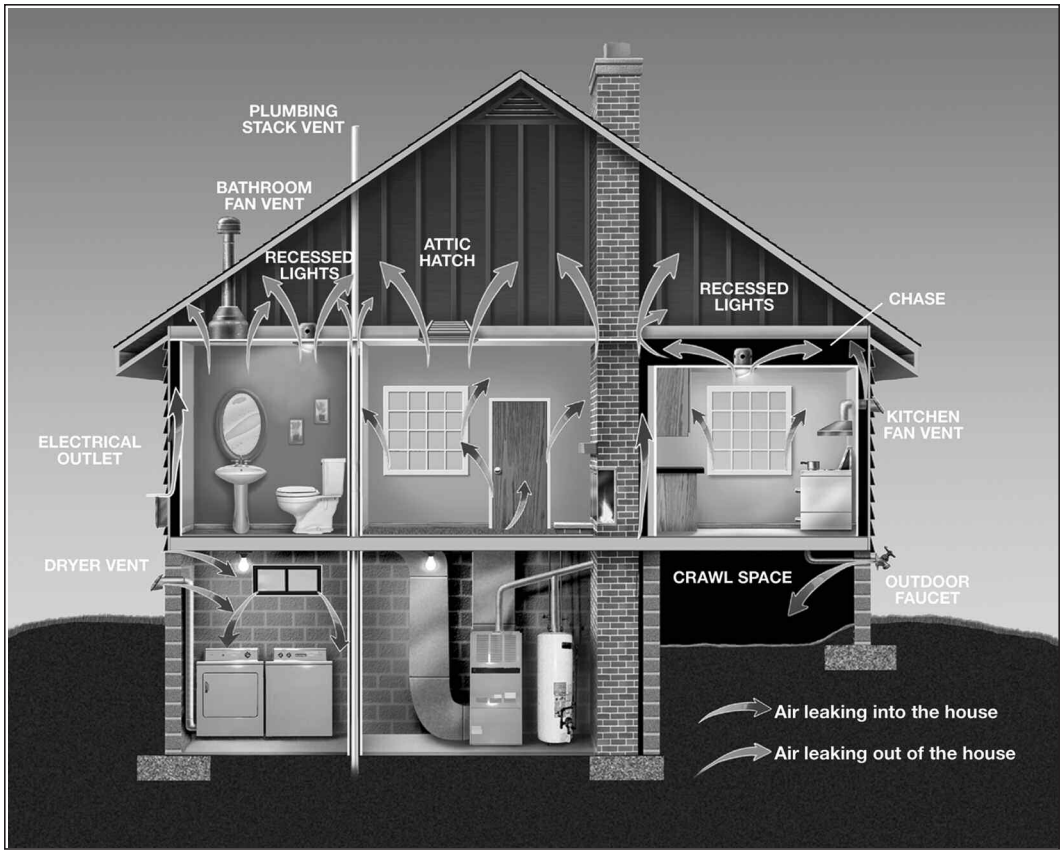


CHANGE FOR THE BETTER WITH ENERGY STAR
PARTNER OF THE YEAR 2004

LOWE'S COMPANIES, INC.
Mooresville, North Carolina

Evidence of Lowe's strategic commitment to ENERGY STAR includes everything from a dedicated ENERGY STAR staff and regular ENERGY STAR progress meetings to features in its annual and social responsibility reports and visual standard guidelines for ENERGY STAR. Moreover, this commitment translated into a 38 percent increase in stocking and a 44 percent increase in sales of ENERGY STAR qualified products in 2004—more than double its overall sales growth of 18 percent. Lowe's has consistently delivered and expanded its consumer education activities through sales associate training, in-store promotions, vendor and utility promotions, TV ads, direct mail, and its Web site—altogether reaching 95,000 sales associates and more than 10 million customers per week. ***(For a complete list of ENERGY STAR Award Winners for 2004, see page 26.)***

POTENTIAL AIR LEAKS IN A HOME



improve the efficiency and comfort of the home, and backs up contractor work with a strong quality assurance program. Key states and metropolitan areas that operate Home Performance with ENERGY STAR programs are New York, Wisconsin, California, Massachusetts, Missouri, Atlanta, Georgia, and Austin, Texas. By the end of 2004, these states and metro areas completed close to 12,000 whole house retrofits, with many retrofits saving between 25 and 40 percent of total energy costs. To facilitate the national expansion of Home Performance with ENERGY STAR, EPA collaborated with DOE and HUD to financially support the Building Performance Institute (BPI) with a $1 billion grant to establish a nationwide accreditation and certification program for whole house performance contractors.

In 2004, EPA continued to promote ENERGY STAR Home Sealing as an effective means to cut energy costs and improve the comfort of homes by properly insulating homes and sealing air leaks within the home's envelope. In many cases, home owners can do this work themselves.

CHANGE FOR THE BETTER WITH ENERGY STAR

PARTNER OF THE YEAR 2004

PARDEE HOMES

Los Angeles, California

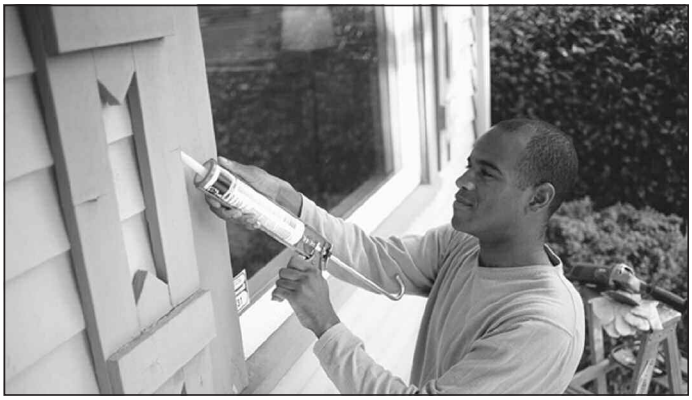
Pardee Homes began its solid commitment to building and qualifying 100 percent of its homes as ENERGY STAR in January 2002, firmly establishing energy efficiency as a core value of the company. First test marketed in 1998, Pardee's ENERGY STAR marketing commitment will account for nearly 7,000 qualified homes built during 2004 in the California and Nevada regional markets. The most recent example is Pardee's role as the first builder to showcase ENERGY STAR qualified products, systems, and programs as a key design focus in the television series "Extreme Makeover Home Edition." The show reaches an estimated 23 million viewers each week and is a great platform for demonstrating the benefits of energy efficiency that an ENERGY STAR qualified home offers. ***(For a complete list of ENERGY STAR Award Winners for 2004, see page 26.)***

EPA worked closely with major retailers to promote ENERGY STAR Home Sealing through do-it-yourself clinics as well as in-store promotions. EPA developed and distributed the new "Do-It-Yourself Guide to ENERGY STAR Home Sealing," an easy-to-use instruction booklet for home owners to improve the comfort and energy efficiency of their homes through better insulating and air sealing practices.

In addition to envelope improvements promoted under ENERGY STAR Home Sealing, EPA began to lay the ground work for a proper HVAC installation program. HVAC industry professionals have demonstrated that proper installation, including proper refrigerant charge, air flow over the coils, and properly sealed ducts, ensures that HVAC systems operate at peak efficiency. Poorly installed equipment can impose a 10 to 20 percent energy penalty on the system. EPA is working closely with the Air Conditioning Contractors of America (ACCA) and the Consortium for Energy Efficiency (CEE) to develop industry-accepted standards for proper installation that achieve real energy savings. These organizations will continue their work over the coming year to assist EPA in the development of a proper HVAC installation program.

In 2005, EPA will:

- Update energy efficiency specifications for more products, including those for televisions, dehumidifiers, telephony, air conditioners, heat pumps, and light fixtures. EPA will also add external power supplies (cordless phone or cell phone chargers, for example) and battery chargers to the ENERGY STAR suite of qualifying residential products.
- Continue to build consumer awareness of ENERGY STAR. EPA will continue its public service campaign providing consumers with five simple steps they can take to help reduce energy use at home and prevent greenhouse gas emissions. EPA will also coordinate focused national campaigns for lighting products, home electronics, and cooling equipment. The goal is to raise awareness of the ENERGY STAR label as a credible symbol for energy efficiency and environmental protection to more than 70 percent over the next several years.
- Work with manufacturers, retailers, home builders and raters, utilities, and states in broad consumer promotions of ENERGY STAR qualified products and new homes. In 2005, EPA expects 175 million ENERGY STAR qualified products to be sold and 170,000 new ENERGY STAR homes to be constructed.



- Increase the stringency of the specification for ENERGY STAR qualified new homes to reflect improvements in the International Energy Conservation Code (IECC). For the first time, EPA's new home specification is expected to include lighting and appliances. And builders will be able to earn the ENERGY STAR label for their homes through either a performance path or a prescriptive path.
- Pilot an Indoor Air Quality (IAQ) specification paired with the ENERGY STAR specification for new homes. The IAQ specification will address moisture control, radon, pest control, HVAC, combustion safety, building materials, and commissioning. EPA will run a limited number of pilots over the next 3 years.
- Continue to expand Home Performance with ENERGY STAR nationally by assisting the contractor accreditation and technician certification program of BPI. EPA expects that more than 21,000 whole house retrofits will be completed by the end of 2005 under this program.
- Develop an installation and maintenance program for HVAC systems to complement the ENERGY STAR label for HVAC. EPA anticipates pilot projects in 2006 followed by implementation of a full national program by 2007.

PROGRAM EVALUATION: MEASURING RESULTS IN THE ENERGY STAR PROGRAM

In 2004, the ENERGY STAR program helped Americans save nearly $10 billion on their energy bills while avoiding 30 million metric tons of greenhouse gas emissions—emissions equivalent to those from 20 million vehicles.[5] The benefits resulting from key strategies are estimated as outlined below.

ENERGY STAR Products and New Homes

By 2004, more than 1.5 billion ENERGY STAR qualifying products had been purchased, and more than 360,000 ENERGY STAR new homes had been constructed. These efforts are estimated to have saved 61 billion kWh of electricity and $5.1 billion on energy bills, while avoiding 13 MMTCE of greenhouse gas emissions. These estimates were developed as follows:[6]

Products

- Sales of products due to the ENERGY STAR program are determined as those above and beyond established business-as-usual purchases of these products. These sales are estimated by:
    - Collecting annual sales data on ENERGY STAR qualifying products from participating product manufacturers as a condition of partnership and supplementing these data by industry reports on total annual product sales as necessary. These data are screened and issues resolved.
    - Using established business-as-usual baselines for annual product sales for each product category. These baselines use historic data and expert judgment and typically reflect increasing market shares for efficient products and increasing product efficiencies over time.
- Annual energy savings are calculated using established values for the difference in annual energy use between a single ENERGY STAR product and a typically purchased product. For these values, EPA:
    - Assumes that ENERGY STAR products just meet the ENERGY STAR thresholds, even though there are some products that exceed this level.
    - Assumes the typically purchased product meets minimum efficiency standards where standards exist or uses the average energy use for the product category where there are no standards.
    - Supports primary data collection, such as product metering to collect power use information, where additional information is necessary to estimate energy savings.
- Peak power savings are estimated using product-specific factors that reflect the contribution of the annual energy savings from a product to peak load savings.
- Net energy bill savings reflect the incremental purchase price of ENERGY STAR qualifying products, where there is a price premium, and use national sector-specific fuel prices.
- Avoided emissions of greenhouse gases are determined using marginal emissions factors for CO_2 derived from energy efficiency scenario runs of national energy models. EPA is currently using the integrated utility dispatch model, Integrated Planning Model (IPM®), to estimate these emissions factors.[7]
- The potential for double-counting benefits, such as counting the energy savings from ENERGY STAR qualifying HVAC equipment installed in new ENERGY STAR homes in both areas, is addressed.

New Homes

- EPA receives data quarterly from third-party verifiers (home energy raters) on the number of homes they verified to be ENERGY STAR, as a condition of program partnership. These raters abide by a set of quality assurance practices to ensure data quality. In addition, EPA reviews the submitted data and resolves any data irregularities.
- EPA recognizes that some new homes that qualify for ENERGY STAR are not a direct result of the program and that many homes built to ENERGY STAR levels due to the program are not labeled or reported to the program. Currently, EPA estimates the former number of homes to be lower than the latter.
- Annual energy savings are calculated using established values for the energy savings from a home that meets the ENERGY STAR level relative to a home built to code. Energy bill savings are calculated using average national energy prices for the residential sector.
- Peak power savings and avoided emissions of greenhouse gases are determined using approaches similar to those described for products.

Commercial Buildings

EPA estimates that 65 billion kWh and $4.2 billion were saved while avoiding 13.2 MMTCE of greenhouse gas emissions due to ENERGY STAR commercial sector efforts in 2004. EPA estimates these benefits as follows:[8]

- Annual electricity savings are determined using a peer-reviewed methodology developed for the commercial building sector, which estimates national electricity savings due to market transformation programs throughout the United States. The methodology uses more than a decade of economic, product shipment, and other time-series data. It distinguishes electricity savings attributable to energy efficiency programs such as ENERGY STAR and those attributed to market effects such as declining prices for efficient products. It also distinguishes the electricity savings from utility-run demand-side management programs and other market transformation programs, such as DOE's Rebuild and FEMP programs and regional energy efficiency programs, so that the estimated annual electricity savings from ENERGY STAR do not overlap with these efforts.
- The peak power savings are estimated using system specific factors that reflect the contribution of the energy savings from lighting and other building improvements to peak load savings.
- Net energy bill savings reflect the incremental investment in ENERGY STAR measures determined by using simple payback period decision criteria and use national commercial sector fuel prices.
- Avoided emissions of greenhouse gases are determined using marginal emissions factors for CO_2 as discussed above.
- The potential for double-counting, such as including the electricity savings from ENERGY STAR office equipment used in commercial buildings, has been addressed.

Industry

EPA partners in the industrial sector are estimated to have avoided 4.1 MMTCE of greenhouse gas emissions in 2004. While they also achieved significant reductions in electricity use and fuels, as well as energy bill savings, these benefits are not estimated due to the lack of data. EPA estimates program benefits as follows:

- Industrial partners use one of two methods to report greenhouse gas emissions reductions. Either partners file reports under the federal Voluntary Reporting of Greenhouse Gases Program (1605(b)) that are reviewed by EPA or, in a small number of cases, EPA works with individual companies to estimate their emissions reductions.
- EPA adjusts the reported results to account for business-as-usual improvements, structural changes in the sector that do not reflect efficiency improvements such as plant sales or closures, and program benefits attributable to the commercial building efforts or other federal programs. Process-related actions are included in the results, whereas activities such as recycling, lighting improvements, and transportation improvements are not.

[5] *EPA's Qualified Products and Buildings sector savings are $5.1 and $4.2 billion, respectively. Savings from DOE's Qualified Products ($0.9 billion) bring total ENERGY STAR savings to around $10 billion. Greenhouse gas savings from EPA Qualified Products, Homes, Buildings, and Industrial sectors are 12.8, 0.2, 13.2, and 4.1 MMTCE, respectively for a total of 30.3 MMTCE.*

[6] *For more details on many aspects of this method, see the peer-reviewed articles, "Savings Potential of ENERGY STAR Voluntary Labeling Programs," by Carrie A. Webber and Richard E. Brown; and "Savings Estimates for the ENERGY STAR® Voluntary Labeling Program: 2001 Status Report" by Carrie A Webber, et al.*

[7] *For more details on IPM, see "Documentation Summary for EPA Base Case 2004 (V.2.1.9) Using the Integrated Planning Model" at http://www.epa.gov/airmarkets/epa-ipm/docsummary.pdf*

[8] *For more details on many aspects of this method, see Marvin J. Horowitz, "Electricity Intensity in the Commercial Sector: Market and Public Program Effects," The Energy Journal, Vol 25, No. 2, Spring 2004, pp. 115 – 137, and "Economic Indicators of Market Transformation: Energy Efficient Lighting and EPA's Green Lights," The Energy Journal, Vol. 22, No. 4, Fall 2001, pp. 95 – 122.*

"With more than 200 stores across four states, energy management and conservation is not only a responsibility, but a priority for everyone at Giant Eagle. We have long been committed as a company to being a friend to the environment, and being named the 2004 ENERGY STAR Partner of the Year is an honor that we take great pride in earning."

—David Shapira, Chairman and CEO, Giant Eagle

ENERGY STAR in the Commercial Sector

EPA offers the ENERGY STAR partnership to organizations of all types and sizes, encouraging senior level executives and decisionmakers to commit to superior energy management. As a result, these organizations reap the economic and environmental benefits that come with energy savings. Many U.S. buildings and industrial facilities can use 20 to 30 percent less energy by making cost-effective investments in energy efficiency. EPA provides standardized measurement tools, proven business strategies to capture substantial environmental and economic benefits, and recognition for organizations when they meet important milestones. Commercial sector highlights for 2004 include:

More organizations committed to superior energy management. In 2004, many new businesses and organizations joined with EPA to pursue superior energy management. Local governments led the way, doubling the number of new partners over the previous year. By year end:

- More than 13,000 organizations, including small businesses, were working with EPA to improve their energy management practices.
- ENERGY STAR partners represented about 13 billion square feet of building space across the country or approximately 19 percent of the commercial building market.

Thousands of buildings benchmarked for energy performance. EPA's energy performance rating system is growing as a valuable means for assessing the baseline energy performance of buildings and targeting investments. The performance rating, launched in 1999, compares the energy use of an individual building against the national stock of similar buildings using a 1 to 100 point rating system. The rating shows whether a building is a high or low energy performer, or somewhere in between. To date, the system has been used to evaluate about 21,000 buildings representing more than 3.5 billion square feet (or 12 percent of the total eligible market). This includes 34% of hospitals, 22% of office buildings, 21% of supermarkets, 13% of schools, and 9% of hotels. Also in 2004, the rating was extended to more building types, including financial centers, courthouses, bank branches, warehouse/storage facilities, residence halls, and medical offices. EPA now provides the commercial market with the capability to rate building types that represent more than 50 percent of the sector's energy use.

CHANGE FOR THE BETTER WITH ENERGY STAR

PARTNER OF THE YEAR 2004

NEW YORK-PRESBYTERIAN HOSPITAL

New York, New York

New York-Presbyterian Hospital (NYPH) delivers comprehensive medical services to residents of New York City and its surrounding boroughs, handling 100,000 discharges, scheduling more than 850,000 outpatient visits, delivering 11,500 babies, and accommodating 178,000 emergency visits each year. NYPH joined ENERGY STAR in 2003, recognizing that every dollar saved on energy costs is a dollar that could be devoted to healthcare delivery or medical research. Under the leadership of a full-time energy program manager, NYPH rated the energy performance of all its facilities and set a goal of achieving and maintaining ENERGY STAR status for both its hospitals and medical office buildings in 2005. The hospital is well on its way toward accomplishing these goals, having already been recognized as an ENERGY STAR Leader for achieving a 10-point portfolio-wide improvement from the first round of energy-saving capital projects. NYPH's combined savings in energy is equivalent to generating more than $18 million in new business. ***(For a complete list of ENERGY STAR Award Winners for 2004, see page 26.)***

More top performing buildings earn the ENERGY STAR. EPA offers the ENERGY STAR label to businesses and public institutions as a way to distinguish buildings that are top energy performers—those that score in the top 25 percent on the rating system while meeting industry standards for indoor air quality. Through 2004:

- Nearly 2,000 buildings, representing almost 400 million square feet, earned the ENERGY STAR, saving a significant amount of energy and avoiding unnecessary greenhouse gas emissions. These top performers use about 40 percent less energy than average buildings.
- The ENERGY STAR label could be found in every U.S. state and the District of Columbia on the following building types: office buildings, schools, financial centers, bank branches, supermarkets, courthouses, hospitals, medical offices, hotels, residence halls, and warehouses.
- EPA expanded the ENERGY STAR program to new building design. Nine commercial building design projects have already received the "Designed to Earn the ENERGY STAR" graphic because the estimated energy performance of these building designs met EPA criteria. The completed buildings will be eligible to receive the ENERGY STAR after maintaining superior energy performance for one year.

Increased recognition for organizations achieving important milestones. In 2004, EPA launched a new initiative, ENERGY STAR Leaders, to recognize partners that establish baseline ratings for their organization-wide energy use and achieve energy efficiency improvements of 10, 20, or 30 points above the baseline across their portfolio. EPA recognized a diverse set of 18 organizations as ENERGY STAR Leaders in October 2004 (see box below). Of these Leaders, seven had already achieved an average portfolio-wide rating of 75 or better.

THE 2004 ENERGY STAR LEADERS

Achieving a 10-point improvement portfolio wide

Colorado Springs School District 11
Colorado Springs, CO

The Vanguard Group
Valley Forge, PA

Achieving a 20-point improvement portfolio wide

Cambridge Savings Bank
Cambridge, MA

Achieving an average portfolio-wide rating of 75 or better

Cambridge Savings Bank
Cambridge, MA

Columbus Hospitality
Columbus, OH

Food Lion, LLC
Salisbury, NC

Giant Eagle
Pittsburgh, PA

Granite Properties
Plano, TX

H.E. Butt Grocery Company
San Antonio, TX

USAA Real Estate Company
San Antonio, TX

Completing the portfolio-wide baseline

Academy School District 20
Colorado Springs, CO

Douglas, Emmett & Company
Los Angeles, CA

Glenborough Realty Trust, Inc.
San Mateo, CA

The Hartford
Hartford, CT

Muskogee Public Schools
Muskogee, OK

New York-Presbyterian Hospital
New York, NY

Parkway Properties
Jackson, MS

The Saunders Hotel Group
Boston, MA

The World Bank
Washington, DC

"We are pleased to be recognized as an ENERGY STAR Partner of the Year. This award not only acknowledges the efforts of district staff and students, but also sends a clear message to the community that the district is a responsible steward of the environment and their tax dollars. With the help of ENERGY STAR, the district has saved more than $4 million in energy costs and used these funds to enhance student achievement."

—Thomas Fernandez, Energy Manager, Colorado Springs School District 11

Many service providers, utilities, states, and others are leveraging the ENERGY STAR commercial program. In 2004, EPA continued to partner with interested organizations, such as energy service providers, utilities, state energy groups, and public benefits funds administrators to provide clear, accurate information to energy end-users about opportunities for improved energy performance. By the end of 2004, 55 energy efficiency program sponsors across the United States were partnering with EPA to offer resources to end-user customers, enabling them to be more energy efficient. Highlights include:

- NSTAR, a major New England utility, completed the first phase of a benchmarking pilot program with ENERGY STAR for customers who control over 7 million square feet of floor space.
- The Business Council of Fairfield County (CT) (formerly SACIA), in cooperation with Connecticut Light and Power (CL&P), won approval from the Energy Management Board of Connecticut for a one million dollar utility retro-commissioning pilot program which begins with the assessment of building performance using EPA's energy performance rating system.
- Nicor Gas, the largest natural gas distributor in northern Illinois, is using EPA's Guidelines for Energy Management as the framework for presenting energy management and demand-side incentives to its commercial and industrial customers.
- Service and Product Providers (SPPs) increased their activities. In 2004, the number of SPP partners grew to almost 800 (with the addition of 175 new partners), and they helped benchmark nearly 1,650 buildings. More than 80 of these buildings showed at least a 10-point energy performance improvement during the year. SPPs also assisted in labeling more than 250 buildings in 2004.
- The California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRs) are using building energy performance benchmarking to improve the financial and environmental performance of their real estate holdings through energy efficiency.

More ENERGY STAR qualifying products. More ENERGY STAR qualified products came to market for the commercial sector. In 2004, EPA added vending machines and updated specifications for computer monitors and exit signs.

CHANGE FOR THE BETTER WITH ENERGY STAR

PARTNER OF THE YEAR 2004

SYLVANIA

Danvers, Massachusetts

As the number one lighting manufacturer in North America, SYLVANIA is dedicated to leading the cause for excellence in the manufacture and promotion of energy-efficient products. In 2004 SYLVANIA increased its ENERGY STAR qualified product line by 50 percent over 2003 by adding eight new ENERGY STAR qualified compact fluorescent light (CFL) bulbs. SYLVANIA held seminars for the commercial and industrial community at its Lightpoint educational facility and created the first ever "See Energy in a New Light" seminar, which was designed to educate and inform lighting designers and engineers about available lighting solutions that address new technology and federal energy codes. These initiatives, coupled with installation of energy-efficient products and environmental programs at its facilities, demonstrate SYLVANIA's superior commitment to energy efficiency and a cleaner environment. ***(For a complete list of ENERGY STAR Award Winners for 2004, see page 26.)***

"Protecting the environment through sound energy management is a major organizational priority for us at USAA Real Estate Company. As an ENERGY STAR partner, we are striving to achieve superior energy performance in our organization. The ENERGY STAR program is good for our bottom line and good for the environment. "

—Edward B. Kelley, President and CEO, USAA Real Estate Company

In 2005, EPA will:

- Launch a new ENERGY STAR Challenge–*Building a Better World 10% at a Time*. In coordination with key associations and states, the Challenge calls on U.S. businesses and institutions to reduce energy use by 10 percent or more. In partnership with these organizations, EPA will help build campaigns that encourage building owners to participate in the ENERGY STAR Challenge.
- Recognize those organizations that improve the energy performance of their building portfolios by 10, 20, 30 points or more as ENERGY STAR Leaders for demonstrating superior energy management and portfolio-wide improvements.
- Update and expand the energy performance rating system with the following modifications:
  - Facilitate the hosting of EPA's energy performance rating system by third parties, with the goal of making it easier for companies to benchmark their customers' facilities using their own energy tracking software;
  - Work with the Energy Information Administration to analyze the latest Commercial Buildings Energy Consumption Survey (CBECS) and state survey data to refine and update current system information; and
  - Expand to more building types such as discount stores, fast food restaurants, and home centers in the near future.

- Update and expand ENERGY STAR specifications for products such as ice machines, commercial dishwashers, and clothes washers.
- Assess opportunities for bundling energy-efficient commercial products into packages of recommended products of interest to particular market segments such as commercial kitchens. This strategy will be closely coordinated with state and local energy efficiency program sponsors with the goal of developing an effective program model for increasing the efficiency of new restaurants.

CHANGE FOR THE BETTER WITH ENERGY STAR

PARTNER OF THE YEAR 2004

FOOD LION, LLC

Salisbury, North Carolina

Food Lion, LLC, one of the largest supermarket chains in the United States, operating more than 1,200 stores in 11 states, continues to produce exceptional results for itself and the environment through its energy management approach. Food Lion joined ENERGY STAR in 1998, and over the past 4 years, with the full support of upper management, has reduced its energy usage by more than 25 percent or 1.6 trillion BTUs, exceeding even its most optimistic energy management goals. During the last 3 years alone, the company has reduced carbon dioxide emissions by more than 940 million pounds and saved enough energy to power 285 stores. During 2004, Food Lion brought the number of stores earning the ENERGY STAR label to 200 and was recognized as an ENERGY STAR Leader for achieving a portfolio-wide rating greater than 75. ***(For a complete list of ENERGY STAR Award Winners for 2004, see page 26.)***

"Toyota was founded on the principles of continuous improvement, or "kaizen," and respect for people... these principles shape the way we do business and provide the foundation for our environmental and energy policies. ENERGY STAR has contributed to the shaping of our energy management program by providing tools and resources, and with this combination has brought us success leading to where we are today."

—Dennis Cuneo,
Senior Vice President,
Toyota Motor of
North America

ENERGY STAR in the Industrial Sector

Through ENERGY STAR, EPA helps manufacturers identify the best in energy performance for their companies and assists them in developing strategic energy management programs. These programs are built on the principles of organizational commitment and continuous improvement. Strategic corporate energy management with sustained progress and decisionmaking leads to a better environment and improved financial health for a company.

For some industrial sectors, EPA convenes Industry Focuses. An Industry Focus is a targeted effort to improve energy efficiency within a specific manufacturing sector. Industry Focuses encourage strategic corporate energy management, provide the tools needed to achieve and measure continuous improvement, and create a supportive environment where ideas and opportunities are shared. For each Focus, EPA prepares an energy guide, which is an analysis of the energy efficiency opportunities in an industry's manufacturing plants. To enable an advanced level of energy management in a focus industry, EPA also develops plant energy performance indicators (EPIs). An EPI scores a plant's energy efficiency relative to that of the entire industry and enables corporations to manage energy aggressively and set realistic improvement goals.

In 2004, EPA initiated several Industry Focuses, enhanced the networking opportunities for partners from all sectors, provided tools and resources geared toward energy strategies, and supported all industries in their efforts to manage energy well.

During 2004, EPA managed six Industry Focuses with interested manufacturing sectors:

- **Automobile/Motor Vehicle Manufacturing.** At the request of the industry, EPA held the third annual focus to exchange energy efficiency practices for assembly plants and improve the efficiency of production processes. One hundred percent of the companies with U.S.-based assembly plants participated. EPA revised the draft EPI based on industry review comments and offered the energy guide to the entire industry. EPA also coordinated with the Alliance of Automobile Manufacturers to identify opportunities for the industry to meet its Climate VISION commitments. To encourage greater information dissemination, EPA created a forum for this industry to take advantage of DOE's plant energy tools.

- **Cement.** EPA conducted the first cement industry focus. Participating companies represented 40 percent of the clinker (output from a cement kiln) production capacity in this sector. Taking industry review comments into consideration, EPA produced a revised EPI for evaluating cement plant energy efficiency. Distribution of the cement energy guide continued during 2004. EPA coordinated with the Portland Cement Association to identify opportunities for achieving the industry's Climate VISION commitments; participation in ENERGY STAR is a prominent part of the industry's work plan. To encourage greater information dissemination, EPA created a forum for the cement industry to take advantage of DOE's plant energy tools.

- **Corn Refining.** The second annual corn refining focus was held in November 2004, with 96 percent of the U.S.-based corn refining capacity represented. EPA collaborated with the industry to test a draft corn refinery EPI and continued to disseminate this industry's energy guide.

- **Glass.** EPA initiated work on an energy guide for the glass industry by consulting technology specialists, industry experts, and partners to gather resource material. Initial contacts were made with the key corporate energy managers in the leading U.S.-based glass companies to begin discussion of a glass focus.
- **Petroleum Refining.** EPA continued the development of a petroleum focus initiated in late 2003. Meetings were held with the industry's corporate energy managers to discuss potential systems for benchmarking the energy efficiency of petroleum refineries in the United States. Using industry review comments, EPA revised the draft energy guide, outlining key opportunities for improving energy use in petroleum refineries.
- **Pharmaceuticals.** Working with the pharmaceutical industry, EPA improved the draft energy guide for its manufacturing plants. Significant discussions were held with industry leaders about the scope of an EPI for pharmaceutical manufacturing plants. They indicated an EPI would be a useful energy management tool and offered to assist in its development.

In 2005, EPA will:

Expand its work with specific industrial sectors, as follows:

- Convene an Industry Focus with the pharmaceutical industry and develop an initial EPI tool for industry testing.
- Conduct the fourth annual automobile/motor vehicle Industry Focus and release the first complete EPI for auto assembly plants.
- Organize the third annual cement Industry Focus and finalize the cement plant EPI.
- Hold the third annual corn refining Industry Focus and finalize the corn refining EPI.
- Initiate meetings with the glass industry to plan for an EPI and first focus meeting.
- Evaluate an existing petroleum refinery benchmarking system to determine whether data of similar quality and value to the ENERGY STAR EPI are produced.
- Convene a water and wastewater Industry Focus.
- Increase partner networking opportunities and participation by holding a biannual in-person networking meeting.
- Improve the participation of public sector organizations in networking opportunities.
- Produce a guidebook for development of energy teams based on the ENERGY STAR Guidelines for Energy Management.

"For California Portland Cement, protecting the environment through sound energy management is a major priority. As an ENERGY STAR partner, we value superior energy performance in our organization. We have found that participating in ENERGY STAR just makes good business sense."

—Jim Repman, CEO, California Portland Cement Company

ENERGY STAR 2004 AWARD WINNERS

CORPORATE COMMITMENT

New York State Energy Research and Development Authority
Albany, NY

SUSTAINED EXCELLENCE

3M
St. Paul, MN

Eastman Kodak Company
Rochester, NY

Ence Homes
St. George, UT

Food Lion, LLC
Salisbury, NC

Nevada ENERGY STAR Partners
Las Vegas, NV

Pardee Homes
Los Angeles, CA

Servidyne Systems, LLC
Atlanta, GA

USAA Real Estate Company
San Antonio, TX

PARTNER OF THE YEAR RETAILER

Lowe's Companies, Inc.
Mooresville, NC

LEADERSHIP IN ENERGY MANAGEMENT

California Portland Cement Company
Glendora, CA

Colorado Springs School District 11
Colorado Springs, CO

Giant Eagle, Inc.
Pittsburgh, PA

Marriott International, Inc.
Washington, DC

New York-Presbyterian Hospital
New York, NY

The Saunders Hotel Group
Boston, MA

Toyota Motor Manufacturing North America, Inc.
Erlanger, KY

Transwestern Commercial Services
Houston, TX

EXCELLENCE IN ENERGY SERVICES

Avista Advantage
Spokane, WA

NSTAR Electric
Boston, MA

EXCELLENCE IN HOME IMPROVEMENT

Austin Energy
Austin, TX

Wisconsin Focus on Energy
Madison, WI

PARTNER OF THE YEAR PRODUCT MANUFACTURERS

Canon U.S.A., Inc.
Lake Success, NY

GE Consumer and Industrial - Appliances
Louisville, KY

Gorell Enterprises, Inc.
Indiana, PA

Lennox Industries Inc.
Richardson, TX

Sea Gull Lighting Products, Inc.
Riverside, NJ

SYLVANIA
Danvers, MA

Whirlpool Corporation
Benton Harbor, MI

NATIONAL PRODUCT CAMPAIGNS

GE Consumer and Industrial - Lighting
Louisville, KY

Maytag Corporation
Newton, IA

Wisconsin Focus on Energy
Madison, WI

EXCELLENCE IN APPLIANCE RETAILING

Sears, Roebuck and Co.
Hoffman Estates, IL

EXCELLENCE IN PRODUCT LABELING

Panasonic
Secaucus, NJ

RETAIL COMMITMENT AWARD

The Home Depot
Atlanta, GA

PARTNER OF THE YEAR NEW HOMES

Astoria Homes
Las Vegas, NV

Cambridge Homes
Altamonte Springs, FL

D.R. Horton, Inc. – Sacramento Division
Fort Worth, TX

David Powers Homes
Houston, TX

Energy Sense
Houston, TX

Guaranteed Watt Saver Systems-West, Inc.
Oklahoma City, OK

Veridian Homes
Madison, WI

LEADERSHIP IN ENERGY EFFICIENCY

California Investor-Owned Utility Companies:

- Pacific Gas & Electric Company
  San Francisco, CA
- San Diego Gas & Electric
  San Diego, CA
- Southern California Edison Company
  Rosemead, CA
- Southern California Gas Company
  Los Angeles, CA

CenterPoint Energy
Houston, TX

Governor Robert L. Ehrlich, Jr. and the Maryland Energy Administration
Annapolis, MD

MidAmerican Energy Company
Des Moines, IA

New Jersey Board of Public Utilities, Office of Clean Energy
Newark, NJ

Northeast ENERGY STAR Lighting and Appliance Initiative
Lexington, MA

TXU Electric Delivery
Dallas, TX

Wisconsin Focus on Energy
Madison, WI

"Sears not only sustained its commitment to energy efficiency in 2004, but raised the standard as well. We worked hard on multiple fronts to bring ENERGY STAR appliances to a broader cross section of Americans, and we're very proud of the fact that no other retailer sells more ENERGY STAR appliances than Sears."

—Tina Settecase, Vice President and General Manager of Home Appliances, Sears, Roebuck and Co.

CLIMATE LEADERS

EPA launched Climate Leaders in February 2002 to challenge individual companies to develop long-term comprehensive climate change strategies. Companies implement their strategies by setting an aggressive greenhouse gas emissions reduction target and reporting on progress through submitting annual inventory data to EPA. By reporting inventory data to EPA, partners create a lasting record of their accomplishments and are able to identify themselves as corporate environmental leaders. Companies also develop a corporate-wide Inventory Management Plan, which institutionalizes best practices in measuring and reporting greenhouse gas emissions. In these ways, corporate partners gain a better understanding of the risks and opportunities associated with global climate change.

In 2004, Climate Leaders:

- Welcomed 14 new corporate partners for a total of 66 partners.
- Announced 7 additional corporate greenhouse gas emissions reduction targets. Through 2004, 27 Climate Leaders partners have publicly stated greenhouse gas targets.
- Placed a public service announcement (PSA) in six national publications to recognize the environmental leadership of Climate Leaders partners.
- Published four cross-sector and one sector-specific greenhouse gas inventory core module guidance documents.

In 2005, EPA will:

- Attract 20 additional corporate partners.
- Announce 20 new Climate Leaders corporate greenhouse gas emissions reduction targets.
- Publish the first edition of *Climate Leaders Design Principles*.
- Develop a new Climate Leaders Program Guide and various sector fact sheets.
- Continue to recognize Climate Leaders through PSAs in national publications.
- In collaboration with partners, begin to develop inventory guidance for projects addressing offsets of greenhouse gas emissions.

PARTNER GREENHOUSE GAS (GHG) REDUCTION GOALS ANNOUNCED IN 2004

The company targets announced through 2004 will prevent an average of 7.5 MMTCE per year above projected business-as-usual baselines. These reductions are equivalent to the annual emissions from 5 million vehicles.

- Ball Corporation pledged to reduce U.S. GHG emissions by 16 percent per production index from 2002 to 2012.
- Baxter International pledged to reduce U.S. GHG emissions by 16 percent per unit of production value from 2000 to 2005.
- The Collins Companies pledged to reduce total U.S. GHG emissions by 18 percent from 2000 to 2010.
- First Environment, Inc. pledged to achieve net zero U.S. GHG emissions by 2008.
- GE Transportation pledged to reduce global GHG emissions by 25 percent per dollar of revenue from 2003 to 2008.
- Hasbro, Inc. pledged to reduce total U.S. GHG emissions by 30 percent from 2000 to 2007.
- Roche Group U.S. Affiliates pledged to reduce total U.S. GHG emissions by 10 percent from 2001 to 2008.

2004 ENERGY STAR CHP AWARD AND EPA CHP CERTIFICATES OF RECOGNITION

2004 ENERGY STAR CHP Award winners

California Institute of Technology
Pasadena, CA

LaFarge North America/ Trigen-Cinergy Solutions of Silver Grove
Silver Grove, KY

2004 EPA CHP Certificates of Recognition winners

Borden Chemical
South Glen Falls, NY

Greater Rochester International Airport
Rochester, NY

Johnson & Johnson
LaJolla, CA

Yale University
New Haven, CT

New York Power Authority
Brooklyn, NY (2)
Staten Island, NY
Bronx, NY

CLEAN ENERGY PROGRAMS

Combined Heat and Power Partnership

In October 2001, EPA introduced the Combined Heat and Power (CHP) Partnership as part of the President's National Energy Policy. CHP projects offer tremendous potential for pollution prevention by using the waste heat that is produced in many industrial processes and as a by-product of electricity generation. CHP systems provide many benefits, including cost savings, enhanced reliability of the electric system, and local economic development. Compared with conventional separate heat and power, CHP projects are highly efficient—often reaching 75 percent efficiencies and higher—and can be installed in a variety of settings, including large industrial plants, college campuses, hospitals, hotels, and commercial buildings. EPA recognizes the most efficient projects each year through the ENERGY STAR CHP Award.

To maximize the use of cost-effective, efficient CHP, the partnership works with the CHP industry; state and local governments; commercial, institutional, and industrial energy users; and other organizations to facilitate project development and to improve the markets for combined heat and power. EPA provides education, outreach, technical assistance for candidate sites, and public recognition for exceptional CHP projects.

In 2004, the CHP Partnership:

- Grew to 145 partners and facilitated 32 new CHP projects, totaling 1,260 MWe of new CHP capacity.
- Co-sponsored CHP workshops in New York, Iowa, Tennessee, Georgia, Colorado, Texas, and Massachusetts to increase the level of knowledge about CHP among energy users, to recognize highly efficient projects, and to share case studies of CHP Partnership assistance.
- Provided public recognition to eight projects that demonstrated high operating efficiency by presenting them with ENERGY STAR CHP Awards or EPA CHP Certificates of Recognition.
- Expanded project facilitation services to provide tailored technical and informational assistance to address issues that arise during different stages of project development.
- Continued strategic market development efforts in the ethanol industry by producing an industry-specific fact sheet, sponsoring workshops in Iowa and Wisconsin, and engaging in direct outreach to ethanol plant owners and their design engineers.
- Released *Output-Based Regulation: A Handbook for Air Regulators* to educate air regulators on innovative ways to recognize the efficiency benefits of CHP.

In 2005, EPA will:

- Assist partners with more than 30 new projects, facilitating the development of over 800 MWe of new CHP capacity.
- Produce and publicize clean energy state policy guidelines focusing on policies affecting CHP and clean distributed generation.
- Continue to educate state air regulators on the methods and benefits of creating output-based environmental regulations.
- Co-sponsor CHP outreach events in multiple states to further inform potential CHP users about its benefits.
- Continue strategic market development activities with the ethanol industry and initiate new strategic market efforts in the wastewater treatment sector and in hotels and casinos.
- Revise and expand the CHP Partnership Web site to include a CHP procurement guide, a guide to the CHP project development process for energy users, and a guide to funding resources.

"Dairyland and our members have worked hard to advance green power in our cooperative system, and we are happy to be a leader in such a beneficial energy technology,"

—John McWilliams, Resource Planner, Dairyland Power Cooperative

Green Power Partnership

EPA launched the Green Power Partnership in 2001 in response to a recommendation in the President's National Energy Policy. The partnership's goal is to lower the cost of renewable energy by enlisting large electricity purchasers to buy a percentage of their power from green power sources. EPA also works to increase green power's value by offering public recognition to leading green power purchasers. As increasing numbers of large electricity customers demand green power, electricity providers will respond by investing in new renewable energy capacity to meet this growing demand. EPA supports the development of green power markets in several ways, such as providing emissions benefits information, recognizing leading purchasers through annual green power awards, and supporting the development of third-party certification so consumers can be confident that they are getting what they pay for.

In 2004, renewable energy purchasing grew among major companies, universities, government agencies, and other organizations as a strategy for demonstrating environmental leadership. The Green Power Partnership welcomed 313 new partners in 2004. EPA provided technical assistance to partners, including comparison of various green power products and information on strategies for maximizing the

2004 GREEN POWER LEADERSHIP AWARDS

Partner of the Year

Clif Bar, Inc.
Berkeley, CA

Montgomery County, MD
Rockville, MD

Staples, Inc.
Framingham, MA

U.S. General Services Administration, Region 2
New York, NY

WhiteWave Foods
Boulder, CO

Green Power Purchasing

Alterra Coffee Roasters
Milwaukee, WI

College of the Atlantic
Bar Harbor, ME

Edwards Air Force Base
Edwards AFB, CA

Interface, Inc.
Atlanta, GA

Johnson & Johnson
New Brunswick, NJ

Lundberg Family Farms
Richvale, CA

New York State Municipal Wind Buyers Group
Conklin, NY

Salt Lake City
Salt Lake City, UT

Whole Foods Market
Austin, TX

On-site Generation

California State University at Hayward
Hayward, CA

City and County of San Francisco, Moscone Convention Center
San Francisco, CA

Harbec Plastics, Inc.
Ontario, NY

Mauna Lani Resort
Kohala Coast, HI

Rodney Strong Vineyards
Healdsburg, CA

benefit of a green power purchase. EPA also publicly recognized exceptional partners through its participation in local events, press releases, speaking engagements, the Green Power Leadership Club, and national Green Power Awards.

In 2004, the Green Power Partnership:

- Welcomed an additional 313 partners for a total of 549 organizations that have made a combined commitment to purchase more than 2 billion kWh of green power annually, including 1.6 billion kWh from new renewable energy resources.
- Created resources for partner recognition and technical assistance, including a Web listing of the top 25 green power purchasers and a comprehensive *Guide to Purchasing Green Power.*
- Provided recognition to leading green power purchasers through local press events and the national Green Power Leadership Awards.
- Debuted an updated Web site that offers the public and partners more information about green power, purchasing guidance, and more.

In 2005, EPA will:

- Engage 300 new partners to purchase green power, bringing the total to more than 800.
- Assist new and existing partners in purchasing more than 2.5 million MWh of green power annually.
- Encourage 100 current partners to increase their purchases of green power.
- Create new resources for partner recognition and technical assistance, including fact sheets designed to appeal to specific business sectors.
- Expand public recognition of outstanding partners by offering speaking roles at established business sector conferences alongside EPA staff.

STATE AND LOCAL PARTNERSHIP PROGRAMS

Since 1992, EPA's State and Local Program has been helping state and local governments maximize the environmental and economic benefits of their clean energy policies. As state and local needs have evolved, so have EPA's services and partnerships. States have developed policies and programs that deliver low-cost, reliable clean energy. These policies reduce energy costs, improve efficiency, lower greenhouse gas emissions, improve air quality and public health, and promote economic development. Many state governments have made clean energy initiatives a priority and see opportunities to align clean energy actions with other objectives.

EPA is encouraging state and local government collaborative approaches for developing cost-effective clean energy policies due to the multitude of benefits to the environment, their economies, and quality of life. The program has developed an extensive network of state and local officials and a rich suite of tools and resources for aligning environmental objectives with their economic, energy, and public health goals. These include analytic tools and guidance documents to assess the impacts of policies on energy, the economy, public health, and the environment; direct technical assistance on specific policies and best practices; and forums and workshops to foster information exchange among state and local officials.

In 2004, the State and Local Program:

- Designed the Clean Energy-Environment State Partnership Program, a new voluntary initiative that reflects the needs of state officials. This program encourages states to develop and implement comprehensive clean energy strategies that will help fulfill their clean energy and environmental goals and lead to public health and economic benefits.
- Developed new guidance documents on incorporating energy efficiency and renewable energy (EERE) into air quality planning, helped states incorporate EERE measures into their local air pollution control plans, and facilitated the inclusion of supplemental environmental projects in state environmental enforcement cases. EPA worked with four states and five communities to estimate the air quality benefits of EERE measures and incorporate the measures into their State Implementation Plans (SIPs).
- Provided two states with analytic support to help estimate the macroeconomic impact of energy efficiency and renewable energy policies. The states discovered that they could achieve significant reductions in fossil fuel energy use and emissions while promoting EERE, creating jobs, and saving money.

"EPA's Clean Energy-Environment State Partnership Program is providing tools and resources to help a Connecticut stakeholder group evaluate the economic, environmental, and public health benefits of several key clean energy recommendations. Through it's collaboration with EPA, the state is now better positioned to move from policy analysis to implementation."

—Chris James, Director of the Planning and Standards Division, Connecticut Department of Environmental Protection

- Launched a new heat island Web site that describes urban heat islands and their energy, air quality, and public health impacts. It provides communities and building owners with steps to reduce summertime temperatures. Estimates of community-level cooling energy savings from heat island reduction strategies range from 10 to 25 percent.
- Supported the Puget Sound Clean Air Agency stakeholder process involving 27 organizations, which resulted in a clean energy action plan. The plan includes recommendations for nine clean energy actions that will reduce greenhouse gas emissions.

In 2005, EPA will:

- Launch the new State Clean Energy-Environment Partnership Program, designed to help states adopt clean energy policies and deploy programs that will reduce greenhouse gas emissions, save energy, promote reliable and affordable electricity generation, and increase economic development in the states.
- Help up to 15 states develop Clean Energy-Environment Action Plans.
- Release the *Clean Energy and Environment Guide to Action* that will help states take advantage of the environmental and economic benefits that clean energy offers.
- Publish a heat island guidebook that will provide easy-to-understand technical information on temperature reducing measures—in particular, cool roofing and strategic tree planting—and guidance on implementing heat island mitigation projects and programs.
- Release the Co-Benefits Risk Assessment model, a tool that generates rough estimates of the public health effects associated with changes in air pollution levels at the state and local levels. This tool will enable officials to compare pollution scenarios associated with different policies and to incorporate human health effects into their decisions.
- Continue to provide state and local officials and their national associations with technical assistance, tools, and outreach to promote the environmental, public health, energy, and economic benefits of reducing energy use. Provide six or more states with hands-on assistance to facilitate the progress of clean energy policies and programs.

"Ohio is committed to promoting the efficient use of energy to achieve a broad range of public policy goals. The EPA Clean Energy-Environment State Partnership Program is helping us realize our potential by identifying and analyzing opportunities to advance clean energy that are cost effective, help enhance economic development, and protect public health and the environment."

—Sara Ward, Chief, Office of Energy Efficiency,
Ohio Department of Development

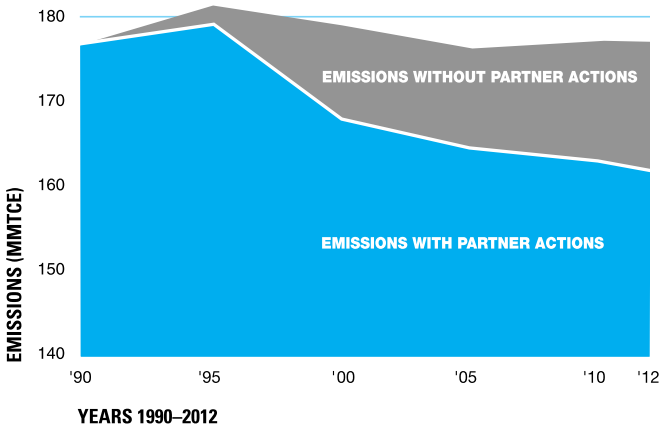
METHANE PROGRAMS

Methane's contribution to total U.S. greenhouse gas emissions is second only to that of carbon dioxide. Each ton of methane emitted is over 20 times more effective at trapping heat in the atmosphere than one ton of CO_2. At the same time, methane, the major component of natural gas, is also a valuable source of energy.

U.S. industries along with state and local governments collaborate with EPA in several voluntary partnerships to encourage the profitable collection and use of methane that would otherwise be released to the atmosphere. These methane partnerships include the Landfill Methane Outreach Program, Natural Gas STAR Program, and Coalbed Methane Outreach Program. All follow a common approach—to provide sound technical, economic, and regulatory information on emissions reduction technologies and practices, as well as tools to help implement methane reduction opportunities. Partners profit from these programs by enhancing their operational efficiency and competitive advantage. EPA also provides information and tools to the agricultural community to encourage methane reductions.

In 2004, these voluntary partnerships, in conjunction with a regulatory program to limit air emissions from the nation's largest landfills, kept national methane emissions to well below 1990 levels, and they are projected to remain below 1990 levels through 2012 (see Figure 6).

Figure 6.
Partner actions are projected to maintain methane emissions below 1990 levels through 2012



Source: EPA Climate Protection Partnerships Division

"Curtailing methane releases would take the nations of the world a long way toward slowing the growth of greenhouse gases, and in the view of some scientists, stabilize their growth in the world."

—Red Cavaney, CEO, American Petroleum Institute
as quoted in *The Oil and Gas Journal*, February 21, 2005

Landfill Methane Outreach Program

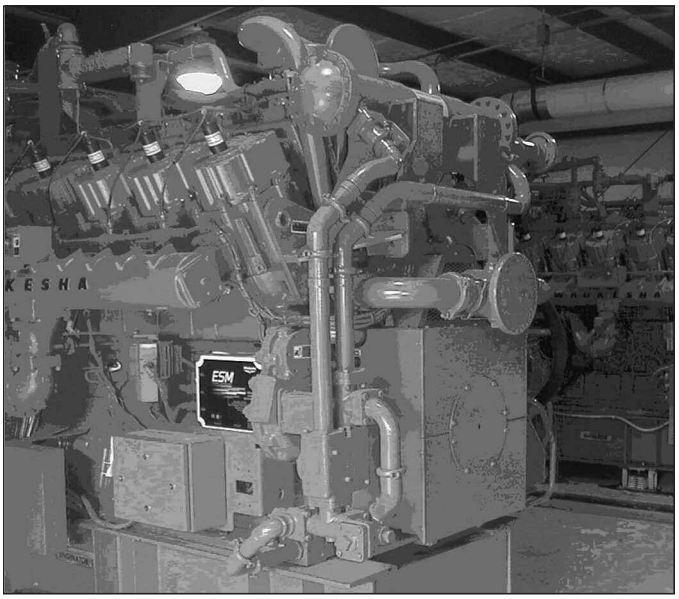
Landfills are the largest source of U.S. human-related (anthropogenic) methane emissions. Capture and use of landfill gas (LFG) not only reduces methane emissions directly, but also reduces CO_2 emissions indirectly by displacing the use of fossil fuels. The Landfill Methane Outreach Program (LMOP) encourages landfills across the country and overseas to capture and use their landfill gas emissions as a renewable energy source. Together with landfill owners, state energy and environmental agencies, energy suppliers, industry, communities, and other stakeholders, LMOP lowers the barriers to landfill gas energy (LFGE) project development.

Since the program's launch in December 1994, LMOP has assisted with 279 projects and reduced methane emissions from landfills by approximately 23 MMTCE. In addition, the total number of landfill gas energy projects has grown to nearly 380. In 2004 alone, LMOP assisted all 33 LFGE projects that became operational, resulting in a reduction of 4.4 MMTCE.

LMOP focuses its outreach efforts on the smaller landfills not regulated by EPA's New Source Performance Standards and Emission Guidelines. The program's varied tools help landfill owners and operators overcome barriers to project development. These tools include feasibility analyses, software for evaluating project economics, profiles of hundreds of candidate landfills across the country, a project development handbook, and energy end-user analyses.

In 2004, LMOP:

- Assisted in the development of 26 new landfill gas energy projects and 7 project expansions, with more than 30 additional projects under construction and expected online soon.
- Welcomed 53 new partners, increasing participation by 14 percent and bringing the total number of LMOP partners to 424.
- Collaborated with the Department of Energy-Atlanta and state energy offices in Florida, Mississippi, and North Carolina to deliver three landfill gas energy workshops in the Southeast, reaching more than 400 project stakeholders.
- Implemented a corporate and federal end-user market strategy, providing landfill gas energy opportunities to more than 20 U.S. corporations, representing over 275 manufacturing facilities nationwide.



In 2005, EPA will:

- Assist in the development of 33 new landfill gas energy projects.
- Release new and updated resources to advance project development, including a streamlined version of LMOP's LFG project evaluation tool (LFGcost) and the third edition of *Funding Landfill Gas Projects: A Guide to State, Federal, and Foundation Resources*.
- Host the 9th Annual LMOP Conference and Project Expo and state and regional workshops to present the benefits of landfill gas energy, discuss project development activity and opportunities, and address issues affecting landfill gas projects.

PROJECT OF THE YEAR — LINKING ATLANTIC WASTE DISPOSAL LANDFILL TO HONEYWELL

In 2002, Honeywell Nylon along with LMOP Industry Partners Enerdyne Power Systems, Inc. and Waste Management Inc. (WMI) collaborated to construct a 23-mile landfill gas pipeline—the longest in the United States—to transport medium-BTU LFG from WMI Atlantic Waste Disposal Landfill in Waverly, Virginia, to the Honeywell Nylon plant in Hopewell, Virginia. When the pipeline was completed in January 2004, it began reducing the site's demand for natural gas fuel by 15 percent. The project links one of the largest landfills east of the Mississippi River with the largest natural gas consumer east of the Mississippi River. Built to accommodate a LFG flow of more than 14,000 standard cubic feet per minute (scfm), the pipeline required the approval of three municipalities and seven agencies.

"The reduction in CO_2 air emissions over the life of the landfill, for example, is equivalent to planting 5,544 square miles of trees and saving 1.2 billion gallons of oil."

—Keith Togna, Site Energy Leader,
Honeywell Hopewell Plant

LMOP ENERGY PARTNER OF THE YEAR (DIRECT LFG END USER) — NUCOR CORPORATION

Nucor Corporation, the largest steel producer and recycler in the United States, purchases approximately 650 scfm of recovered landfill gas collected by LMOP Industry Partner Granger Energy, LLC, from the Morgan County Regional Landfill, an LMOP Community Partner, in Alabama. The landfill replaces about 10 to 15 percent of Nucor's natural gas consumption needs. To capitalize on this cost-effective fuel source, the LFG is transported to a mixing station located at Nucor Steel Decatur's facility, where it is mixed with natural gas prior to fueling the company's tunnel furnaces. This innovative application is relatively new and used in only one other LFGE project.

LMOP ENERGY PARTNER OF THE YEAR (ELECTRICITY PROJECT) — DAIRYLAND POWER COOPERATIVE

Today, traditional power production is cheap and mostly generated from fossil fuels. One energy cooperative is breaking new ground by adding renewable energy to its power portfolio. Dairyland Power Cooperative and Eau Claire Energy Cooperative teamed with other LMOP Partners, Ameresco Energy Services, Onyx Waste Services, and Waukesha Engines to develop the Onyx Seven Mile Creek LFGE project. This 3-MW project is one of the cornerstones of Dairyland's many renewable projects, with more LFGE projects expected this year and in coming years. Leading by example, Dairyland is using innovative thinking and partnership arrangements to overcome barriers to renewable energy project development.

LMOP INDUSTRY PARTNER OF THE YEAR — AMERESCO, INC.

Having been the 2003 LMOP Industry Partner of the Year, Ameresco's 2004 project accomplishments, emissions reductions, and groundwork for future projects are doubly impressive and worthy of repeat recognition. The company made significant progress in 2004 by bringing four new LFGE projects online quickly and cost-effectively, without tax credits, all while improving the environment and reducing greenhouse gas emissions. In less than 4 years and with few financial incentives, Ameresco has developed eight LFGE projects representing 30 MW, with another 50 MW expected online in 2005.

COMMUNITY PARTNER OF THE YEAR — FAUQUIER COUNTY, VIRGINIA, LANDFILL GAS PROJECT

Given its small size of approximately 1 million tons of waste in place, the Fauquier County landfill would not attract a great deal of interest from traditional LFGE developers. However, LMOP Community Partner Fauquier County and project developers prove that even small projects can succeed. Developed by Commonwealth Green Energy and LMOP Energy Partner Pepco Energy Services as their first foray into renewable electricity from landfill gas, the LFGE facility is best described as a merchant power plant—no tax credits, no subsidies, and no grants. At its peak, a full year of output from the site is expected to generate 15,000 MWh of renewable electricity.

STATE PARTNER OF THE YEAR — MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Receiving an unprecedented five nominations from both public and private sector organizations in Mississippi, the Mississippi Department of Environmental Quality (MDEQ) is a force for advancing LFGE in the state. Under MDEQ's leadership, the Mississippi LFGE Task Force achieved the requirements of being an LMOP state partner in record time—establishing a task force, preparing a LFGE primer, and holding a LFGE workshop within 6 months of becoming a partner. Since that time, MDEQ has worked closely with LMOP staff, landfill owners, project developers, businesses, state agencies, state partners from adjacent states, and utilities to advance project development in Mississippi. They truly understand the potential of landfill gas and are helping form public-private partnerships to establish LFGE projects across the state. The first LFGE project in Mississippi is in the final stages of construction, with many others under development.

"Fauquier County's gas-to-energy operation has been a wonderful addition at the Corral Farm Landfill by converting an environmental pollutant into a renewable energy source, while simultaneously reducing both capital and operating costs. This project was only possible through EPA's Landfill Methane Outreach Program."

—Mike Dorsey, Director of Environmental Services, Fauquier County, Virginia

Natural Gas STAR Program

Natural Gas STAR is a voluntary partnership between EPA and the U.S. natural gas industry designed to overcome barriers to the adoption of cost-effective technologies and practices that reduce emissions of methane. Natural Gas STAR was launched in 1993 with the transmission and distribution sectors and has since expanded twice—to the production sector in 1995 and the processing sector in 2000. The program has achieved significant reductions through 2004, reducing methane emissions from natural gas systems by 6.7 MMTCE in 2004 alone.

Natural Gas STAR has developed a range of tools and resources designed to help corporate partners implement best management practices to reduce gas loss. These include an implementation guide, a series of "Lessons Learned" studies, technology transfer workshops, partner-to-partner information exchanges, and more. Extensive partner support for and continued expansion of the program, combined with ongoing positive feedback from partners, demonstrates the effectiveness of these tools in promoting methane reduction activities.

In 2004, Natural Gas STAR:

- Achieved 66 percent industry participation across all major sectors (production, processing, transmission, and distribution).
- Partnered with 12 new companies, bringing the total number of partners to 111.
- Conducted six technology transfer workshops covering all four sectors of the natural gas industry.
- Achieved 100 percent participation of the American Petroleum Institute member companies.

In 2005, EPA will:

- Work with the oil and gas industry to expand the Natural Gas STAR Program, specifically in the area of small-to-medium size natural gas production companies.
- Conduct eight technology transfer workshops, including two Web/telephone based workshops to enable attendance by companies with limited travel budgets.
- Continue to aggressively work with existing partner companies to expand the methane emissions reduction projects within their companies.

PRODUCTION PARTNER OF THE YEAR

Shell Exploration and Production Company—Shell joined Natural Gas STAR in 1995 and has since reported cumulative methane emissions reductions of 11.5 billion cubic feet (Bcf). The new Gas STAR Implementation Manager, Greg Southworth, has been very active this year by helping co-sponsor the offshore producers workshop and is currently assisting Gas STAR with an upcoming offshore case study. Shell reported the greatest reductions for all production partners, 3.14 Bcf in 2003, providing detailed information on its emissions reduction projects in the Gulf of Mexico.

PROCESSING PARTNER OF THE YEAR

GulfTerra Energy Partners L. P. (formerly El Paso Field Services)—This was GulfTerra's first year of reporting since joining the Program in 2000. The company submitted an impressive report, which included the highest emissions reductions of any processing partner for 2003 (165,370 Mcf) and a significant amount of past emissions reductions. To date, GulfTerra has achieved cumulative methane emissions reductions totaling 2.3 Bcf and has implemented more than 10 partner reported opportunities (PROs).

TRANSMISSION PARTNER OF THE YEAR

Columbia Gas Transmission Company and Columbia Gulf Transmission Company (NiSource Companies)—These companies continue to be top reporters in the transmission sector. Columbia Gas reported the greatest reductions in 2003 (3.9 Bcf) and has achieved the second highest cumulative reductions of all transmission partners (23 Bcf). Columbia Gulf reported the second highest reductions for 2003 (1.1 Bcf) and has achieved the sixth highest cumulative reductions in the transmission sector (6.2 Bcf).

DISTRIBUTION PARTNER OF THE YEAR

NiSource Distribution Operations—The 10 NiSource distribution companies that have partnered with EPA submitted annual reports that together represented 81 percent of the total emissions reductions reported by the Gas STAR distribution sector for 2003. In the past 2 years, NiSource has been working hard to reinvigorate these companies' Gas STAR activities, including quantifying the emissions reduction projects being implemented by all the companies. The NiSource distribution companies have collectively reduced methane emissions by 10.4 Bcf since 1993.

NATURAL GAS STAR ROOKIE OF THE YEAR

Devon Energy Corporation—Since joining the program in July 2003, Devon has been very active and supportive of Gas STAR by holding a high-profile signing ceremony, aiding in development of technical documents, contributing to an article in the *Gas STAR Partner Update*, and volunteering its Bridgeport Gas Plant as a location for filming the new Gas STAR Program video. Devon is implementing a significant number of emissions reduction activities and will submit its first annual report next year.

NATURAL GAS STAR CONTINUING EXCELLENCE AWARDS

BP—BP continues to be a leader in the production sector. The company and its Gas STAR Implementation Manager, Reid Smith, assisted the program with two Partner Reported Opportunity fact sheets this year, two articles for the *Partner Update,* and a case study on offshore activities. Mr. Smith was awarded Implementation Manager of the Year in 2003, and the company was recognized as the Production Partner of the Year in 2001, 2002, and 2003. BP reported the second highest reductions for 2003 (2.7 Bcf), which were primarily attributable to innovative PROs, and can also claim the second highest cumulative reductions (19 Bcf) of all production partners.

Kerr-McGee Oil & Gas Corporation—Kerr-McGee continues to be a leader in the production sector. The company reported the third highest reductions for 2003 (1.2 Bcf) and has achieved the seventh highest cumulative reductions (6.6 Bcf) of all production partners. The company was also recognized for its accomplishments in 2000 and 2003. Plus, Kerr-McGee consistently implements a wide variety of partner reported opportunities every year.

El Paso Pipeline Group, ANR Pipeline Company, Tennessee Gas Pipeline, El Paso Natural Gas, Southern Natural Gas, and Colorado Interstate Gas— (all part of the El Paso Pipeline Group) were all in the top 10 in 2003 reductions, and together totaled 1.8 Bcf of methane emissions reductions. The company's Gas STAR Implementation Manager, John Cordaway, has been very active in the Gas STAR Program by providing substantial insight to various technical issues, contributing to Gas STAR technical support documents, and presenting at several workshops.

Pioneer Natural Resources USA— Pioneer has been one of the most active processing partners since joining the program in 2000. The company has the third highest cumulative achievements for processing partners—having reduced methane emissions by 2.1 Bcf—and has reported an impressive 19 PROs. In 2002, Pioneer was recognized as the Production Partner of the Year. This year the company hosted a workshop, helped EPA develop an implementation case study, and contributed to the development of a number of technical documents.

"Support from our CEO has been extremely important in making our Natural Gas STAR Program a success. From the beginning, it was clear that our participation was a point of pride for the company. Mr. Nichols' (Devon's Chairman and CEO) endorsement demonstrated to all employees, stakeholders, and the public that the Gas STAR Program was a top priority for the company."

—David Templet, Manager of Environmental, Health & Safety, Devon Energy Corporation

Coalbed Methane Outreach Program

The Coalbed Methane Outreach Program (CMOP) reduces methane emissions from underground coal mines by collaborating with large coal companies and small businesses—primarily independent natural gas project developers and equipment supply companies—to develop environmentally beneficial and economically successful coal mine methane (CMM) projects. Outreach efforts focus on providing high-quality, project-specific information. CMOP has achieved significant results through 2004.

EPA began working with the coal mining industry in 1990, when coal mines captured and used only 25 percent of the methane produced from their mine degasification systems. As a result of this collaboration, the percentage of methane recovery grew to about 71 percent by 2003. To eliminate the remaining methane emitted from degasification systems, CMOP is working with industry to use CMM in small-and large-scale power generation, for mine heating and coal drying, and for upgrading low-quality gas to pipeline specifications. Favorable economics also increase the viability of other end-use options for CMM such as vehicle fuel (liquified natural gas and compressed natural gas), manufacturing feedstocks, and use in fuel cells.

Following the program's success in reducing methane emissions from degasification systems, CMOP has expanded its focus to the methane emitted from coal mine ventilation systems. Ventilation air from coal mines typically contains methane at concentrations below one percent, yet accounts for 83 percent of the remaining methane emissions from underground coal mines—about 77 Bcf of methane annually. CMOP is collaborating with industry and other federal agencies to demonstrate and deploy newly developed technologies that can reduce these emissions substantially over the next few years.

Abandoned mines are also a source of methane emissions, accounting for about 10 percent of U.S. CMM emissions from underground mines. CMOP is now actively engaged in promoting reductions from this source. In the United States alone, 20 projects in 2004 captured and used methane from 30 abandoned mines.

CMOP has developed a range of tools designed to overcome the barriers to recovery and combustion of coal mine methane. These include numerous technical and economic analyses of technologies and potential projects, mine-specific project feasibility assessments, state-specific analyses of project potential, market evaluations, and guides to state, local, and federal

Table 4.
Methane Programs: Annual Goals and Achievements

	2004 Goal	2004 Achievement	2005 Goal
TOTAL REDUCTIONS (MMTCE)	**10.6**	**12.9**	**12.6**
LMOP			
Number of Projects	269	279	289
Annual Methane Reductions (MMTCE)	4.3	4.4	4.5
Natural Gas STAR			
Industry Participation (% in program)	64%	66%	66%
Annual Gas Savings (MMTCE)	4.5	6.7	6.3
CMOP			
Annual Methane Reductions (MMTCE)	1.8	1.8	1.8

Source: EPA Climate Protection Partnerships Division

assistance programs. CMOP has collaborated with operators of virtually every major U.S. underground coal mine that has gassy conditions or that emits gases to apply these tools and facilitate projects, which in 2004 alone achieved a reduction of 1.8 MMTCE.

In 2004, CMOP:

- Reduced methane emissions at 15 of the gassiest mines in the country, including the first recovery projects in the western United States, by providing high-quality, project-specific information to mine operators, project developers, and other stakeholders.
- In cooperation with CONSOL Energy and DOE, supported efforts to design, install and operate the first test-scale demonstration of ventilation air oxidation technology in the United States.
- Published the first summary report of abandoned mine methane emissions in the United States, including identification of approximately 400 gassy abandoned mines that may offer development potential.

In 2005, EPA will:

- Launch a targeted outreach effort, working closely with the mining industry in the western United States, to increase mine methane capture and use in Colorado, New Mexico, and Utah.
- Conduct further analysis of abandoned mine methane emissions to refine methodologies for estimating project-specific emissions.
- Initiate more detailed assessment of coal mine methane emissions from surface mines because reports indicate U.S. mining companies are using horizontal boreholes to drain methane from high walls in open caste mining and shallow surface wells to drain methane in advance of surface mining.

PROGRAM EVALUATION: MEASURING RESULTS IN THE METHANE PROGRAMS

EPA relies on the application of sound and comprehensive practices to estimate the annual methane reductions from its programs. EPA gathers and carefully reviews partner data on all methane reduction activities implemented through the partnerships.

Natural Gas STAR

As a condition of partnership, program partners submit implementation plans to EPA describing the emissions reduction practices they plan to implement and evaluate. In addition, partners submit progress reports detailing specific emissions reduction activities and accomplishments each year.

EPA does not attribute all reported emissions reductions to Natural Gas STAR. Partners may only include actions that were undertaken voluntarily, not those reductions attributable to compliance with existing regulations.

Emissions reductions are estimated by the partners either from direct before-and-after measurements or by applying peer-reviewed emissions reduction factors. These estimates are reviewed by EPA and any identified issues are resolved.

Landfill Methane Outreach

EPA maintains a comprehensive database of the operational data on landfills and LFGE projects in the United States. The data are updated frequently based on information submitted by industry, LMOP outreach efforts, and other sources.

Reductions of methane that result from compliance with EPA's air regulations are not included in the program estimates. In addition, only the emissions reductions from projects that meet the LMOP assistance criteria are included in the program benefit estimates.

EPA uses emissions factors that reflect the type of project. The factors are based on research, discussions with experts in the LFG industry, and published references.

Coalbed Methane Outreach

Through cooperation with the U.S. Mine Safety & Health Administration, state oil and gas commissions, and the mining companies themselves, EPA collects mine-specific data annually and estimates the total methane emitted from the mines and the quantity of gas recovered and used.

EPA estimates 40 percent of coal mine methane recovery is due to its partnership activities. This factor was calculated by estimating the increase in the amount of methane capture expected from CMOP activities relative to the methane capture expected from the Energy Policy Act of 1992 (EPAct).

Agriculture Based Programs

Through outreach to agriculture-based organizations and livestock producers, EPA and the U.S. Department of Agriculture (USDA) work together to promote practices that reduce greenhouse gas emissions at U.S. farms. The programs collaborate with the nation's swine and dairy producers to encourage development of waste management systems that generate farm revenues while reducing water and air pollution. Currently, there are 170 operating or planned systems in the United States. EPA provides technical information and tools to aid in the assessment and implementation of these projects.

In 2004, EPA and USDA:

- Continued to expand methane-reducing technologies in the livestock sector to help ensure clean water and air and held extension events to market these opportunities. Such activities take place as part of the second year of Farm Bill funding under Section 9006.
- Assisted swine and cattle producers in carrying out projects that produced nearly 400 million kWh/year of renewable energy from farms capturing methane. This energy is then used by the farm and local community.
- Organized a national conference to provide environmental, program, market, state-of-the-art technical, and funding information on anaerobic digestion systems.

In 2005, EPA and USDA will:

- Continue coordinating the implementation of anaerobic digestion funding mechanisms under the 2002 Farm Bill.
- Collaborate with state energy programs across the country to facilitate the development of anaerobic digesters as renewable energy resources.
- Update the AgSTAR Handbook, and develop the second version of FarmWare to provide farmers with guidance and tools for evaluating and successfully applying proven anaerobic digestion technology.

HIGH GLOBAL WARMING POTENTIAL GAS PROGRAMS

Public-private industry partnerships are substantially reducing U.S. emissions of the high global warming potential (GWP) gases released as byproducts of industrial operations. These partnerships involve various industries that are developing cost-effective improvements in their industrial processes to reduce emissions of perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF_6)—all particularly potent greenhouse gases. When compared ton-for-ton with CO_2, they trap much more heat in the atmosphere. PFCs and SF_6 also have very long atmospheric lifetimes. Despite the potential for sizable growth in high GWP greenhouse gas emissions, these partner industries are expected to maintain their emissions substantially below 1990 levels through the year 2012 (see Figure 7).

The Voluntary Aluminum Industrial Partnership (VAIP)

The primary aluminum producers are collaborating with EPA to reduce direct emissions of PFCs and CO_2. The goal is to reduce emissions where technically feasible and cost effective. Since the partnership began in 1995, participating industries have had notable success in characterizing the emissions from their smelter operations and reducing overall emissions.

In support of the President's Climate VISION (Voluntary Innovative Sector Initiatives: Opportunities Now) initiative, VAIP is committed to a direct carbon intensity reduction target of 53 percent from 1990 levels by 2010. The goal includes reductions in emissions of perfluoromethane (CF_4) and perfluoroethane (C_2F_6), which are inadvertent byproducts of the smelting process, plus CO_2 from the consumption of the carbon anode. As large energy consumers, the primary producers also agreed to continue their efforts to reduce indirect CO_2 emissions through ongoing energy efficiency improvements. The aluminum industry has made progress in reducing greenhouse gas emissions for more than a decade, and this new commitment equates to an additional direct carbon intensity reduction of 25 percent beyond the 2000 achievement.

VAIP has reduced PFC emissions by more than 45 percent and direct carbon emissions by more than 54 percent compared to the industry's 1990 baseline. The Aluminum Association will collaborate with EPA in measuring progress for the President's Climate VISION initiative based on data collected from VAIP member companies and pledges to support climate protection through efforts to increase aluminum recycling and develop lightweight vehicles.

In 2004, the Voluntary Aluminum Industrial Partnership:

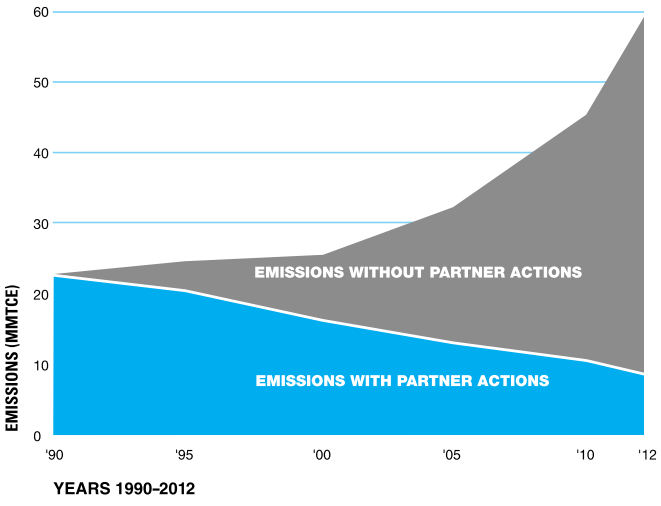
- Completed a global survey of facility-specific emissions measurements and evaluated data to support updating the IPCC Inventory Guidance for primary aluminum.
- Remeasured PFC emissions at a partner facility after advanced emissions control technologies were installed. This project quantified emissions reduction benefits of investments in currently available technical options.
- Evaluated 1990 and 2000 partner data to establish Climate VISION baseline estimates.

HFC-23 Emission Reduction Program

Industry is working with EPA to reduce emissions of the potent greenhouse gas, HFC-23, a byproduct in the manufacture of the refrigerant HCFC-22. Through this program, EPA encourages all U.S. producers of HCFC-22 to develop and implement feasible, cost-effective processing practices or technologies to reduce HFC-23 emissions.

Partners have reduced emissions of HFC-23 through process optimization and thermal destruction. Their efforts have helped significantly reduce the intensity of HFC-23 emissions (the amount of HFC-23 emitted per kilogram of HCFC-22 manufactured). As a result of these efforts, emissions in 2004 were more than 6.4 MMTCE lower than they would have been at the 1990 emission intensity. In 2004, EPA partnered with 100 percent of the U.S. HCFC-22 producers to use process optimization and abatement to reduce production byproduct emissions of HFC-23—the most potent and persistent of the hydrofluorocarbons.

Figure 7.
Partner actions can maintain voluntary program sector emissions of high global warming potential gases at or below 1990 levels through 2012



Source: EPA Climate Protection Partnerships Division

The PFC Reduction/Climate Partnership for the Semiconductor Industry

Since its inception in 1996, this partnership has been a catalyst for semiconductor companies in Europe, Japan, Korea, Taiwan, and the United States to set the first global target for reducing greenhouse gas emissions. With EPA, these companies have identified and implemented process changes and manufacturing tool improvements in the production of integrated circuits to reduce emissions of PFCs. EPA's partners are currently installing advanced emission control technologies to further reduce PFC emissions.

While the partnership's initial focus was on reducing PFC emissions from U.S. semiconductor fabrication plants, EPA and its industry partners quickly recognized the advantage of addressing this global environmental challenge through international cooperation. Seeking to maintain a "level playing field" for the many multinational partner companies, the partnership encouraged other nations' governments to develop similar voluntary initiatives. Japan was the second country to establish a voluntary partnership following a meeting organized by Japan's Ministry of International Trade and Industry and EPA in 1996. With the United States and Japan gaining momentum in coordinating PFC emissions reduction activities, the remaining major semiconductor producers including Europe, Korea, and Taiwan joined the effort soon thereafter.

In April 1999, the World Semiconductor Council (WSC), whose members include the national semiconductor industry associations of Europe, Japan, Korea, Taiwan, and the United States, announced a technically challenging goal to reduce PFC emissions by at least 10 percent below the 1995 baseline level by year-end 2010. The WSC's goal represents the first greenhouse gas emissions reduction target for an entire global industry. This type of aggressive goal setting reassures international governments, industry suppliers, and the public of the industry's commitment to protect the climate.

In 2004, the PFC Reduction/Climate Partnership for the Semiconductor Industry:

- Reduced absolute PFC emissions 45 percent below 1999 levels while U.S. manufacturing increased by 20 percent over the same period. EPA's semiconductor industry partners are on track to meet their 2010 Climate VISION commitment.
- Worked with global industry representatives at the International Semiconductor Environment Safety and Health (ISESH) conference to encourage China's rapidly emerging semiconductor manufacturing industry to participate with the WSC in controlling PFC emissions.
- Facilitated the IPCC's kick-off meeting to begin revising methods for estimating fluorinated compound emissions from electronics manufacturing, including semiconductors, liquid crystal displays (LCDs), and photovoltaics.
- Continued seeking opportunities for the closely related technical fields of semiconductor and LCD (i.e., flat panel display) manufacturing to exchange information and expedite PFC emissions reductions.

DR. HIDEKI NISHIDA, CLIMATE PROTECTION AWARD WINNER

Hitachi Displays

In January 2004, the World LCD Industry Cooperation Committee (WLICC), representing the leading LCD manufacturers from Japan, Korea, and Taiwan, announced its goal to reduce PFC emissions to 0.82 MMTCE by 2010—a 90 percent reduction from current emissions. Guided by EPA's model for voluntary industry cooperation, Dr. Hideki Nishida of Hitachi Displays led the WLICC in making such a technically aggressive commitment. EPA awarded Dr. Nishida its 2005 Climate Protection Award in recognition of his global industry leadership and commitment to environmental protection.

SF_6 Emissions Reduction Partnership for Electric Power Systems

In 1999, EPA partnered with several electric utilities to form a voluntary program to reduce sulfur hexafluoride (SF_6) emissions. By reducing SF_6 emissions, partner companies have not only taken an active role in addressing climate change, but have also seen financial savings through reduced SF_6 gas purchases. In addition, equipment reliability has been improved as a result of more careful gas measurement, better leak detection and repairs, and equipment replacement.

The most potent and persistent industrial greenhouse gas, SF_6 is used primarily in high voltage circuit breakers and gas-insulated substations by electric utilities as a gaseous dielectric. The global warming potential of SF_6 is 23,900 over a 100-year time horizon; in other words, it is 23,900 times more effective at trapping infrared radiation than an equivalent amount of CO_2. The average SF_6 emissions rate for partner companies in 2004 was just below 10 percent.

In 2004, the SF_6 Emissions Reduction Partnership for Electric Power Systems:

- Hosted the Third International Conference on SF_6 and the Environment in Scottsdale, AZ. Co-sponsored with the International Magnesium Association, the National Electrical Manufacturers Association, the American Public Power Association, Arizona Public Service, the Australian Greenhouse Office, DOE, and the Electric Power Research Institute, the 2004 conference included a substation field trip to demonstrate the latest leak detection and repair technologies.
- Initiated a study on leak rates of new equipment. The first of its kind, this study will document refilling requirements for high-voltage equipment that has been installed for 5 years or less. The study will help isolate equipment-related leaks from state-of-the-art power equipment versus personnel servicing and handling gas loss issues.
- Developed Benchmark Reports to help partners compare their emissions to those of their electric utility peers. Partners received a customized summary report showing their goal and actual SF_6 emissions reductions since signing the MOU plus partnership averages.

SF_6 Emission Reduction Partnership for the Magnesium Industry

The U.S. magnesium industry is working with EPA to identify and encourage the adoption of best management practices for reducing emissions of sulfur hexafluoride (SF_6), a long-lived and potent greenhouse gas. Launched in 1999, this partnership to reduce emissions from magnesium production and casting operations represents approximately 80 percent of the U.S. magnesium industry. The partnership goal is to eliminate SF_6 emissions by year-end 2010.

In 2004, the SF_6 Emission Reduction Partnership for the Magnesium Industry:

- Reduced absolute SF_6 emissions by 19 percent since EPA launched the program in 1999. 2004 was the fifth year in which EPA collected annual SF_6 emissions reports from magnesium partners.
- Supported partner companies' efforts to evaluate available alternative melt protection technologies such as alternative cover gases AM-Cover™ (HFC-134a) and Novec™ 612 (a fluorinated ketone). An initial EPA study has shown both gases are capable of reducing greenhouse gas emissions by more than 99 percent compared to the traditional SF_6-based protection system.
- Maintained U.S. industry participation in the partnership, representing 100 percent of primary magnesium production and 80 percent of domestic casting and recycling capacity.

"Once we recognized SF_6 as an asset, we were able to build an effective management strategy around it. The SF_6 Emission Reduction Partnership helped us make this transition and provided us with tools to design an effective program"

—Alex Salinas, Technical Specialist, Southern California Edison

Mobile Air Conditioning Climate Protection Partnership

Until 1994, air conditioning systems in most new vehicles used refrigerants that damaged the Ozone Layer and had a high global warming potential. Under the Montreal Protocol on Substances that Deplete the Ozone Layer, countries agreed to protect the ozone layer. As a result, vehicle air conditioning systems worldwide were redesigned. Now, mobile air conditioning systems use a different refrigerant, HFC-134a. HFC-134a has no ozone depleting potential and only one-sixth the global warming potential of the former mobile air conditioning refrigerant, CFC-12. Nonetheless, with a global warming potential of 1,300, HFC-134a is still a strong greenhouse gas.

In order to reduce the climate impacts of mobile air conditioning, the Society of Automotive Engineers (SAE), the Mobile Air Conditioning Society Worldwide, and EPA formed a global voluntary partnership to promote improved air-conditioning systems and service. This partnership is composed of environmental authorities from Australia, Canada, Europe, and Japan; environmental and industry non-government organizations (NGOs); and global vehicle manufacturers and their suppliers. The partnership has four goals:

- To promote cost-effective designs and improved service procedures to minimize emissions from HFC-134a systems.
- To cooperate on developing and testing the next generation of mobile air-conditioning systems that satisfy customer requirements and environmental, safety, cost, and reliability concerns.
- To communicate technical progress to policymakers and the public.
- To document the current and near-term opportunities for improving the environmental performance of mobile air-conditioning system design, operation, and maintenance.

TABLE 5.
High GWP Gas Programs: Annual Goals and Achievements

	2004 Goal	2004 Achievement	2005 Goal
TOTAL REDUCTIONS (MMTCE)	**9.7**	**11.7**	**10.4**
VOLUNTARY ALUMINUM INDUSTRIAL PARTNERSHIP			
Industry Participation (% in program)	98%	98%	98%
Reductions (MMTCE)	2.2	2.2	2.6
HFC-23 PARTNERSHIP			
Industry Participation (% in program)	100%	100%	100%
Reductions (MMTCE)[1]	4.6	6.4	4.8
OTHER STEWARDSHIP PROGRAMS			
Industry Participation (% in program)[2]	50%–100%	45%–100%	50%–100%
Reductions (MMTCE)	2.9	3.1	3.0

[1] *These goals have been adjusted downward to reflect lower than expected HCFC-22 production and the closure of one of the four U.S. HCFC-22 plants. The industry average HFC-23 emission factor actually declined more than expected.*
[2] *Participation varies from 45% of net generating capacity for electric power systems to 100% for primary magnesium producers.*

"Chicago White Metal (CWM) Casting joined EPA's SF_6 Emission Reduction Partnership for the Magnesium Industry as a charter partner in 1999. Since then, our dedicated team has worked closely with EPA, industry suppliers, and other partner companies to track emissions and share information on reduction strategies. In 2004 alone, the process improvements implemented by CWM have reduced SF_6 emissions by 4,920 MTCE and saved our company $11,000."

—Eric Treiber, President, Chicago White Metal Casting

HIGH GLOBAL WARMING POTENTIAL GAS PROGRAMS

It is estimated that air conditioning system improvements will add $35 to $50 to the cost of producing new vehicles with payback in fuel savings within one or two years, and lifetime savings of more than $400. When implemented as an incremental efficiency improvement, this technology will save 3.7 billion gallons of fuel in the United States by 2025 and a comparable amount in the rest of the world. The Mobile Air Conditioning Partnership is developing a new strategy to promote these environmental and product improvements.

In 2004, the Mobile Air Conditioning Climate Protection Partnership:

- Announced the Improved Mobile Air Conditioning (I-MAC) 30/50 project to reduce air conditioning fuel consumption by at least 30 percent and cut refrigerant emissions by 50 percent.

In 2005, across the High GWP Gas Programs, EPA will:

- Participate in the preparation of the *2006 IPCC National Greenhouse Gas Inventory Guidelines for Industrial Processes and Product Use*.
- Develop a Web-based emissions reduction training module for primary aluminum facility managers and pot-room operators. This module will increase awareness of greenhouse gas emissions from aluminum smelting and identify technical and operational opportunities to reduce them.
- Complete the technical analysis phase of the new equipment leak study for the SF_6 Emission Reduction Partnership for Electric Power Systems.
- Conduct Web-cast training sessions for electric utilities and vendors servicing the electric power sector. This training will help SF_6 partners reduce errors in reporting their annual SF_6 emissions.
- Conduct a follow-up study of alternative magnesium melt protection technologies. The results of this study are expected to help the partnership accelerate its phase-out of SF_6 by 2010.
- Continue implementing agreements to reduce greenhouse gas intensity for the aluminum, magnesium, and semiconductor sectors through the President's Climate VISION initiative.
- Maintain an effective partnership with HCFC-22 chemical manufacturers to reduce emissions of HFC-23.
- Expand the stewardship programs to reduce high GWP emissions from other key sources, such as the ozone-depleting substance replacement industries.

PROGRAM EVALUATION: MEASURING RESULTS IN THE HIGH GWP GAS PROGRAMS

Annual high GWP gas reductions achieved by EPA's programs are estimated using reliable data and established methods.

Voluntary Aluminum Industry Partnership

All VAIP partners agree to report aluminum production and anode effect frequency and duration in order to estimate annual PFC emissions.

Reductions are calculated compared to a business-as-usual baseline which uses the industry's 1990 emission rate. The reduction in the emission rate is used to calculate the overall greenhouse gas emissions reductions from the program.

The industry began making significant efforts to reduce PFC emissions as a direct result of the program. All reductions achieved by partners are assumed to result from the program.

HFC-23 Emission Reduction Program

Program partners report HCFC-22 production and HFC-23 emissions to a third party that aggregates the estimates and submits the total estimates for the previous year to EPA.

Reductions are calculated compared to a business-as-usual baseline which uses the industry's 1990 emission rate. The reduction in the emissions rate is used to calculate the overall greenhouse gas emissions reductions from the program.

Subsequent to a series of meeting with EPA, the industry began making significant efforts to reduce HFC-23 emissions. All U.S. producers participate in the program and all reductions achieved by manufacturers are assumed to result from the program.

Environmental Stewardship Program

Partners report emissions and emissions reductions based on jointly developed estimation methods and reporting protocols. Data collection methods are sector specific. Data are submitted either directly to EPA or through a third party.

Reductions are calculated compared to business-as-usual baselines based on industry-wide or company-specific emissions rates in a base year. The reductions in emissions rates are used to calculate the overall greenhouse gas emissions reductions from the program.

The reductions from technologies and process improvements attributable to the partnership are counted, but those developed without the partnership's assistance are not.

INTERNATIONAL CLIMATE PROTECTION AWARD WINNERS

In 1998, EPA established the Climate Protection Awards to recognize exceptional leadership, personal dedication, and technical achievements in protecting the Earth's climate. In its first eight years, 110 awards have been presented to individuals and organizations from 16 countries, including Australia, Belgium, Brazil, Canada, Chile, China, France, India, Italy, Japan, Mexico, Netherlands, South Korea, Sweden, United Kingdom, and the United States. This year, 17 individuals and organizations earned the award by crafting international, national, state, and local policies; reducing energy consumption; and inventing technologies that protect the climate.

CLIMATE PROTECTION AWARD WINNERS

CORPORATE/GOVERNMENT

American Electric Power
Columbus, Ohio

City of Boulder
Colorado

The California Energy Commission
Sacramento, California

Cinergy Corp.
Cincinnati, Ohio

Connecticut Governor's Steering Committee
Connecticut

Johnson Controls
Milwaukee, Wisconsin

3M
St. Paul, Minnesota

McDonald's, Coca-Cola, & Unilever Refrigerants Naturally Partnership
UK and USA

Rhode Island Greenhouse Gas Stakeholders
Rhode Island

City of Syracuse
New York

United Technologies Corporation
Hartford, Connecticut

York International
York, Pennsylvania

INDIVIDUALS

Mr. Sandeep Ganesh, Winrock International
India

Ms. Sonia Hamel, Office of Commonwealth Development
Massachusetts

Dr. Hideki Nishida, Hitachi Displays
Mobara, Japan

ORGANIZATIONS/TEAMS

Improved Mobile Air Conditioning Organizing Team
USA

Tufts Climate Initiative
Massachusetts

BENEFITS OF VOLUNTARY PROGRAMS

Overall, the benefits from program partners' investments and consumers' product purchases through the year 2004 can be summarized as follows (also see Table ES-1):

- More than 790 million metric tons of greenhouse gas emissions are being avoided through 2014.
- Consumers and businesses have locked in investments in energy-efficient technologies of $22 billion.
- Net of the investments in energy-efficient technologies, consumers and businesses are saving $115 billion cumulatively through 2014.

The benefits and how they are derived are described below for three key climate partnership program areas: ENERGY STAR, Methane Programs, and High GWP Gas Programs. These descriptions build on the Program Evaluation summaries included earlier in each of the three program sections.

ENERGY STAR. The estimated benefits from the ENERGY STAR program reflect the stream of energy savings that will persist through 2014 due to technology investments and product purchases made through the year 2004 by ENERGY STAR partners and due to the effects of markets already transformed. The persistence is calculated by maintaining the energy savings achieved in 2004 through the year 2014.[9] The underlying assumption is that the lifetime of most building improvements and product purchases is at least 10 years. For those products with shorter lifetimes, such as computers, fax machines, and audio equipment, "persistence" means that once consumers buy ENERGY STAR qualified products, they are expected to replace them with ENERGY STAR qualified products. The benefits that can be attributed to pre-existing trends are subtracted out of the estimated ENERGY STAR benefits presented in this 2004 Annual Report.

In addition, EPA estimates the net present value (NPV) of expenditures on energy-efficient technologies based on the partners' or customers' cost of the energy-efficient equipment, including the cost of financing.[10] For ENERGY STAR qualified products, expenditures were taken as the incremental increase in cost, if any, of purchasing these products. For ENERGY STAR Building and Industrial Improvements, expenditures include the capital costs of upgrading a building to ENERGY STAR specifications. Finally, the NPV of the net savings is the difference between the NPV of energy bill savings and the NPV of expenditures. It represents the net value to partners and ENERGY STAR product consumers of participating in the program.

The estimated benefits for the ENERGY STAR program from 1993 to 2014 are as follows:

Qualified Products and Homes

- Preventing 160 MMTCE in greenhouse gas emissions.
- Prompting investment of $5 billion in climate friendly technologies.
- Providing energy bill savings net of investment of $60 billion.

Building and Industrial Improvements

- Preventing 239 MMTCE in greenhouse gas emissions.
- Prompting investment of $13 billion in climate friendly technologies.
- Providing energy bill savings net of investment of $51 billion.

Methane Programs. The benefits for programs with a small number of partners, such as Natural Gas STAR and Landfill Methane, are calculated on a project-by-project basis from the list of projects that the programs are known to have affected. Energy bill savings include the revenue from the sale of methane and/or the sale of electricity made from the captured methane. The expenditures include the capital costs agreed to by partners to bring projects into compliance with the Methane programs' specifications and any additional operating costs engendered by program participation. Both energy bill savings and technology expenditures have been placed in net present value terms. These programs are estimated to have the following benefits from 1993 through 2014:

- Preventing 190 MMTCE in greenhouse gas emissions.
- Prompting about $5 billion in investment in climate friendly technologies.
- Providing energy bill savings net of investment of $4 billion.

High GWP Gas Programs. The benefits for these programs are derived from direct partner reports of the greenhouse gas emissions the partners have avoided. Program partners are expected to maintain their investments in technologies and practices through 2014. Expenditures and financial savings in the High GWP Gas Programs are proprietary and are not included in the summary of economic benefits and expenditures. The programs are estimated to have the following benefits from 1993 through 2014:

- Preventing more than 180 MMTCE in greenhouse gas emissions.

[9] *The energy savings for the year 2004 are estimated from information provided by the Division for the ENERGY STAR Building and Industrial Improvements program and from information provided by the Lawrence Berkeley National Laboratory for ENERGY STAR Qualified Products.*

[10] *The NPV of these expenditures was calculated using a 4-percent real discount rate and a 2004 perspective.*

COMPANIES AND ORGANIZATIONS MENTIONED IN THIS REPORT

COMPANIES AND ORGANIZATIONS MENTIONED IN THIS REPORT

COMPANIES AND ORGANIZATIONS MENTIONED IN THIS REPORT

REFERENCES

Builder Magazine. 2003. "Builder 100." May. Published by Hanley Wood, LLC. Available online at www.builderonline.com.

Climate Protection Partnerships Division, U.S. Environmental Protection Agency. 2005. Partner and emissions data for 2004 provided by individual programs within the Climate Protection Partnerships, Office of Atmospheric Programs.

Consortium for Energy Efficiency (CEE). 2005. *National Awareness of ENERGY STAR for 2004: Analysis of CEE Household Survey.* Available online at www.cee1.org/eval/2004_ES_survey_rep.pdf

Energy Information Administration (EIA). 2004. *Annual Energy Review 2004.* Office of Markets and End Use. Available online at www.eia.doe.gov/aer/contents.html. (DOE/EIA-0384(2004).

EIA. 2005. *Annual Energy Outlook 2005 with Projections to 2025.* Office of Integrated Analysis and Forecasting. January. Available online at www.eia.doe.gov/oiaf/aeo/index.html. (DOE/EIA-0383(2005)).

Fairfield Research. 2003. Survey sponsored by *Good Housekeeping*.

Horowitz, M.J. 2001. "Economic Indicators of Market Transformation: Energy Efficient Lighting and EPA's Green Lights." *The Energy Journal* Vol 22, Fall (4):95-122.

Horowitz, M.J. 2004. "Electricity Intensity in the Commercial Sector: Market and Public Program Effects." *The Energy Journal* Vol 25, Spring (2):115-137.

ICF Consulting Inc. 2005. *An Estimate of Emissions Reductions Accomplished by ENERGY STAR Industrial Partners.* Prepared for EPA's Climate Protection Partnerships.

Intergovernmental Panel on Climate Change (IPCC). 1996. *Climate Change 1995: The Science of Climate Change*. J.T. Houghton, L.G. Meira Filho, B.A. Callander, N. Harris, A. Kattenberg, and K. Maskell, eds. Cambridge University Press. Cambridge, UK.

Koomey, J., A. Rosenfeld, and A. Gadgil. 1990. *Conservation Screening Curves to Compare Efficiency Investments at Power Plants*. Lawrence Berkeley National Laboratory. October. (LBNL-27286).

U.S. Environmental Protection Agency (EPA). 2005. *Inventory of Greenhouse Gas Emissions and Sinks: 1990-2003*. Office of Atmospheric Programs. April. (EPA 430-R-05-003). Available online at http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissions.html

Webber, C.A., R.E. Brown, M. McWhinney, and J.G. Koomey. 2005. *Status Report: Savings Estimates for the ENERGY STAR Voluntary Labeling Program (DRAFT)*. Lawrence Berkeley National Laboratory. (LBNL-51319).

FIGURES AND TABLES

United States
Environmental Protection Agency
Air and Radiation 6202J
EPA 430-R-05-010
www.epa.gov
September 2005

United States
Environmental Protection Agency
Air and Radiation (6202J)
Washington, DC 20460-0001

Official Business
Penalty for Private Use
$300

First Class Mail
Postage and Fees Paid
EPA
G-35

Recycled/Recyclable *Printed on paper containing 30% post consumer waste.*