



ENERGY STAR

CHANGE FOR THE BETTER

ENERGY STAR® and Other Voluntary Programs
2002 Annual Report



CHANGE FOR THE BETTER

ENERGY STAR® AND OTHER VOLUNTARY PROGRAMS CLIMATE PROTECTION PARTNERSHIPS DIVISION (CPPD) 2002 ANNUAL REPORT

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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
ASSISTANT
ADMINISTRATOR

September 2003

Congratulations to all the partners of EPA's climate protection programs.

EPA's programs are playing an essential role in helping our Agency meet the greenhouse gas goal that President Bush established in 2002—a significant reduction in the greenhouse gas intensity of our economy. In 2002 alone, Americans—with the help of ENERGY STAR®—saved \$7 billion dollars on their energy bills, saved enough energy to power 15 million homes, and reduced greenhouse gas emissions equivalent to taking 15 million cars off the road. These are real results.

Through voluntary programs such as the Landfill Methane Outreach Program and the Coalbed Methane Outreach Program, we have had success in reducing the emissions of methane to 5 percent below 1990 levels. This impressive reduction is expected to remain through 2020, even as our economy continues to grow.

Through Climate Leaders, companies commit to working with EPA in order to develop a comprehensive inventory of their greenhouse gas emissions and set aggressive long term reduction goals. By the end of 2002, its first year, Climate Leaders welcomed 34 companies as partners.

I want to commend all of the voluntary program partners for your leadership and the example you have set for other companies and organizations to follow. By working together, we are proving that these partnerships are an effective way to reduce greenhouse gas emissions.



*Jeffrey R. Holmstead
Assistant Administrator
U.S. Environmental Protection Agency*

EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

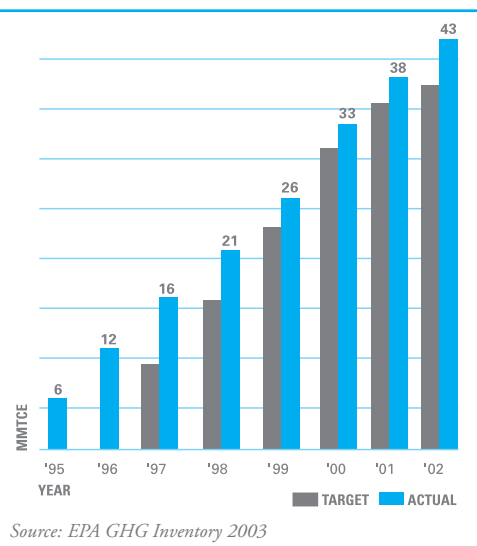
2002 was a banner year for the businesses and organizations that have voluntarily partnered with the Environmental Protection Agency's (EPA) climate protection programs to save energy and reduce greenhouse gas emissions. In 2002, EPA's ENERGY STAR®, Clean Energy, Methane, and Environmental Stewardship programs delivered significant environmental and economic results, while exceeding their goals for reductions in greenhouse gas emissions (see Figure ES-1).¹ In addition, Climate Leaders—a new effort launched in February 2002—enables businesses to take their climate commitments one step further. Seven partners announced aggressive long-term greenhouse gas emissions reduction goals as part of their commitment to the Climate Leaders Program in 2002. These programs are helping the country achieve the Bush Administration's goal of reducing the greenhouse gas intensity of the American economy by 18 percent by 2012.

Some of the major environmental and economic achievements across EPA's climate protection partnerships,² based on actions that partners have taken through the end of 2002, are summarized below.

Environmental Benefits

- The partnerships prevented more than 43 million metric tons of greenhouse gas emissions (in MMTCE³) in 2002 alone—equivalent to the emissions from more than 28 million automobiles (see Figure ES-1).
- More than 150,000 tons of nitrogen oxides (NO_x) were prevented in 2002.⁴

FIGURE ES-1.
Division carbon reductions compared to program goals



- Between now and 2012, more than 40 MMTCE per year in greenhouse gas emissions will be avoided due to actions already taken by partners in these voluntary programs.

Economic Benefits

- Consumers and businesses have locked in investments in energy-efficient technologies exceeding \$12 billion (see Table ES-1).
- Consumers and businesses are saving more than \$80 billion cumulatively through 2012 net of their investments in energy-efficient technologies, having saved more than \$7 billion in 2002 alone (see Table ES-1).

Program Effectiveness

Every federal dollar spent on these partnership programs through 2002 means:

- Reductions in greenhouse gas emissions of 1.0 metric ton of carbon equivalent (3.7 tons of CO₂).
- 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.

¹ Each of EPA's climate protection partnerships is designed to achieve long-term greenhouse gas emissions reduction goals, which were set through an interagency process in 2001 and communicated to the Secretariat of the Framework Convention on Climate Change in the U.S. Climate Action Report 2002.

“By working together, we are proving that these partnerships are an effective way to reduce greenhouse gas emissions.”

*—Jeffrey R. Holmstead, Assistant Administrator
U.S. Environmental Protection Agency*

The environmental and economic benefits for the key EPA partnership program areas—ENERGY STAR, Methane Programs, Clean Energy Programs, and the Environmental Stewardship Programs for the high GWP gases—are summarized in Table ES-1.

TABLE ES-1.
Summary of the benefits for 2002 and cumulative benefits through 2012 from the actions taken by partners through 2002
(in billions of 2002 dollars)

Program	BENEFITS FOR 2002		CUMULATIVE BENEFITS 1993–2012			
	Net Savings	MMTCE	NPV of Bill Savings	NPV of Technology Expenditures	NPV of Net Savings	MMTCE
ENERGY STAR						
Qualified Products	\$4.4	11.9	\$50.4	\$1.6	\$48.8	144
Building and Industrial Improvements	\$2.9	13.3	\$40.4	\$8.0	\$32.5	178
Methane Programs	\$0.2	11.1	\$5.6	\$2.7	\$2.9	163
Clean Energy Programs	—	0.2	—	N/A	—	2
Environmental Stewardship Programs	—	7.4	—	N/A	—	117
TOTAL	\$7.6	43.9	\$96.4	\$12.2	\$84.2	604

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 pages 42-43.

—: Not applicable

N/A: Not available

KEY ACCOMPLISHMENTS FOR 2002

ENERGY STAR

- With the help of ENERGY STAR, Americans saved a significant amount of energy in 2002—more than 100 billion kilowatt-hours (kWh) and 15,000 megawatts (MW) of peak power, the amount of energy required to power about 15 million homes (see Figure ES-2). They also prevented the greenhouse gas emissions equivalent to those from more than 15 million automobiles.
- The ENERGY STAR label has become the national symbol for energy efficiency, recognized by more than 40 percent of the American public.
- More than 1,250 manufacturers use the ENERGY STAR—meeting strict energy efficiency guidelines set by the federal government—across a total of 18,000 individual product models in more than 35 product categories. To date, Americans have bought more than one billion ENERGY STAR qualified products.

² This report provides results for the climate protection partnership programs operated by the Office of Atmospheric Programs at EPA (with the exception of the State and Local Outreach Program). 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 70 MMTCE in 2002.

³ Reductions in annual greenhouse gas emissions for EPA's climate programs, including non-CO₂ 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.

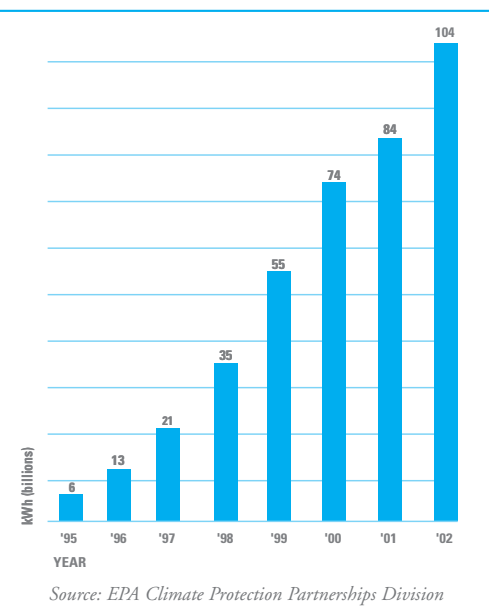
⁴ Based on data from The Emissions & Generation Resource Integrated Database (eGRID2002) Version 2.0, released April 2003.

EXECUTIVE SUMMARY



- By year end 2002, more than 3,000 builders had constructed more than 110,000 ENERGY STAR qualified homes, locking in financial savings for homeowners of more than \$26 million annually.
- EPA's national energy performance rating system has been used to evaluate more than 15,000 buildings; 16 percent of office buildings, 13 percent of schools, 20 percent of supermarkets, 21 percent of hospitals, and 5 percent of hotels have been benchmarked. More than 1,100 buildings have earned the ENERGY STAR.
- Building on New York's success, regional partners in the states of Rhode Island and Massachusetts and in the cities of San Jose, Fresno, and Kansas City have recently launched Home Performance with ENERGY STAR. This is a whole-house retrofit program in which certified contractors recommend—through diagnostic testing—the most cost-effective, energy-efficient home improvements for homeowners.

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



Climate Leaders

- Since Climate Leaders was launched in early 2002, 34 companies have joined. Seven have already announced aggressive greenhouse gas emissions reduction goals.

Clean Energy

- The Green Power Partnership ended the year with more than 90 partners, totaling more than 500,000 megawatt hours (MWh) of green power purchase commitments—including 250,000 MWh from new renewable generation.
- The Combined Heat and Power (CHP) Partnership assisted in the development of 7 projects completed in 2002, totaling about 560 MW of new CHP capacity, with 10 additional planned projects totaling 230 MW.

Methane and High Global Warming Potential (GWP) Environmental Stewardship

- Partnership programs achieved reduction of non-carbon dioxide (CO₂) gases—methane, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF₆)—totaling more than 18 MMTCE in 2002 alone. Through the continuation of these efforts, U.S. methane emissions are expected to be kept below 1990 levels through 2012 and beyond. In addition, industry commitments, such as the recently announced magnesium partnership commitment to eliminate SF₆ emissions by 2010, are significantly reducing emissions of the most potent and persistent gases.

“Partnering with EPA in Climate Leaders is an important next step for FPL Group to take along our journey to assess and reduce emissions at our power plants in Florida and throughout the country.”

—Lewis Hay III, Chairman and CEO, FPL Group, Inc.

EXPECTATIONS FOR 2003 AND BEYOND

Voluntary partnership programs will continue to be a powerful means for reducing emissions of greenhouse gases and air pollutants across the country, while saving businesses, organizations, and consumers money on their energy bills. In the following areas, EPA plans to:

ENERGY STAR

- Review and update performance specifications for products in cases where technology has advanced and updates are necessary to maintain the integrity of the ENERGY STAR label—including computer monitors and imaging equipment—as well as add new products and services to the ENERGY STAR family.
- Continue to build public awareness of ENERGY STAR. Educate consumers and homeowners to be aware that ENERGY STAR can reduce their home energy bills by about 30 percent or more than \$400 annually through a variety of means.

- Offer building energy performance benchmarking and labeling for more building types, such as fast food restaurants, residence halls, post offices, warehouses, courthouses, and banks.
- Build additional partnerships with more businesses and organizations, focusing particularly on small businesses, state and local governments, and school systems.
- Expand the ENERGY STAR Industrial Sector Focuses to corn refining, petroleum refining, and cement manufacturing, while continuing EPA’s efforts with the automobile and brewery sectors.

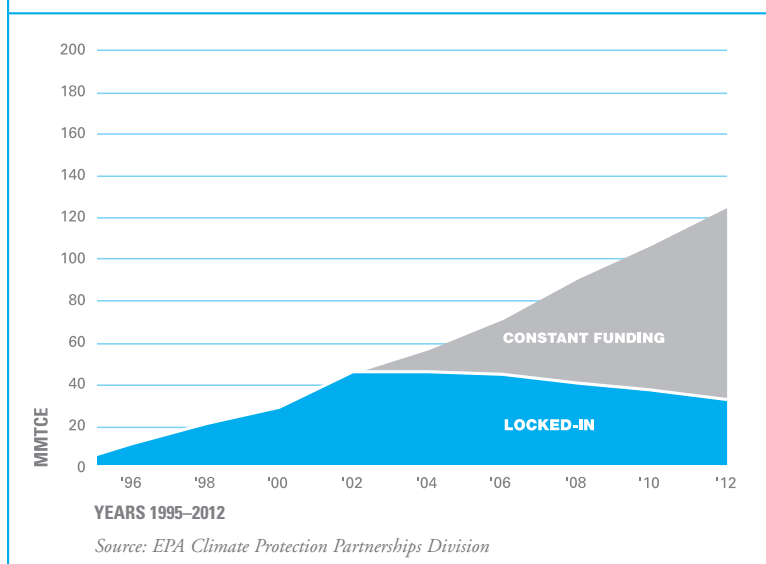
Climate Leaders

- Recruit 30 additional businesses to become Climate Leaders and announce 20 corporate greenhouse gas emissions reduction goals.

Clean Energy

- Double the number of partners in the Green Power Partnership and facilitate the development of 450 MW of new CHP capacity.

FIGURE ES-3.
Annual reductions in greenhouse gas emissions can be more than doubled by 2012



Non-CO₂ Programs

- More than double the cost-effective reductions of the non-carbon dioxide greenhouse gases by 2012. This will maintain methane emissions below 1990 levels and PFC, HFC, and SF₆ emissions below 1990 levels in those sectors with which EPA partners.

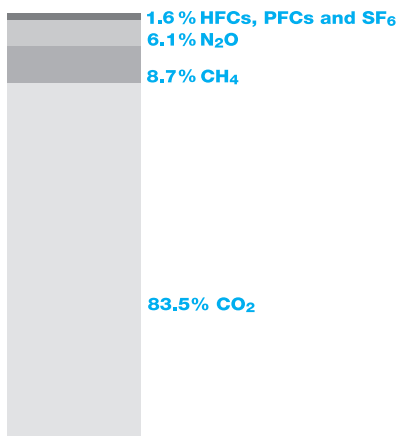
As EPA implements these plans, it expects to almost triple greenhouse gas emissions reductions resulting from these voluntary programs to about 120 MMTCE (see Figure ES-3). These programs represent 64 percent of the estimated 185 MMTCE to be avoided by all EPA climate change programs in 2012.



INTRODUCTION

The quality of our environment is everyone's responsibility. Each of us has the opportunity and the power to change for the better. Whether purchasing an ENERGY STAR product or switching to renewable energy, businesses, organizations, and consumers can play an important role in reducing greenhouse gas emissions and protecting our global environment now and for future generations.

FIGURE 4.
U.S. greenhouse gas emissions by gas



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

Source: EPA GHG Inventory 2003

Greenhouse gases are accumulating in the Earth's atmosphere as a result of human activities and trapping heat in the atmosphere that would otherwise escape. Carbon dioxide (CO₂) released during fossil fuel combustion—the major source of energy in our homes, in commercial buildings, in industry, and for transportation—is the largest component of greenhouse gas emissions in the United States. Other activities, such as industrial processes, cause emissions of additional greenhouse gases—for example, methane (CH₄), nitrous oxide (N₂O), and perfluorocarbons (PFCs) (see Figure 4).

While emitted in smaller quantities, these gases are important to address due to their greater impact per molecule in trapping heat in the Earth's atmosphere and, in the case of PFCs and sulfur hexafluoride (SF₆), their long atmospheric lifetimes (see Table 2). When viewed in terms of economic sectors, emissions from industry account for 30% of U.S. greenhouse gas emissions, followed by transportation (27%), service industry (buildings) (18%), residential (16%), and agriculture (8%) (see Figure 5).

For more than a decade, American businesses and organizations have partnered with EPA's climate protection programs to increase investments in technologies and practices that save energy and reduce greenhouse gas emissions. EPA's public-private partnerships focus on the following opportunities to take action:

Corporate Commitments. Many companies are voluntarily evaluating their impact on the environment and taking actions to change for the better. Businesses that participate in Climate Leaders, a new effort formally launched in early 2002, are working with EPA to inventory their greenhouse gas emissions, set an aggressive long-term reduction goal, and report their annual progress toward this goal.

Energy Efficiency. Energy efficiency means obtaining the same services or output (such as heating or cooling) for less energy input. Energy efficiency offers significant cost savings across the residential, commercial, and industrial sectors through an array of technologies and practices available right now that can reduce the energy bill for many homes and businesses by 20 to 30 percent. The ENERGY STAR program works in partnership with businesses, large and small, and other organizations, such as schools and city governments, to capture these savings.

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

—Charles S. Brown, Senior Vice President and Director, Global Manufacturing & Logistics Eastman Kodak Company, ENERGY STAR Award Winner

Clean Energy. In addition to using energy more efficiently, there are ways to make the energy we use cleaner—effectively breaking the link between increased energy use and harmful air emissions. Combined heat and power as well as renewable sources of energy can play larger roles in the U.S. energy mix. EPA is collaborating with its partners to expand the use of these technologies.

Methane Programs. Although it is a potent greenhouse gas, methane is also the major component of natural gas—a much sought-after clean fuel. When methane emissions are reduced in a cost-effective manner, the recovered methane represents valuable fuel 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 Environmental Stewardship. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) are potent greenhouse gases, and some persist in the environment for thousands of years. Given these long atmospheric lifetimes, various U.S. industries are working aggressively with EPA to avoid significant accumulation of these 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.

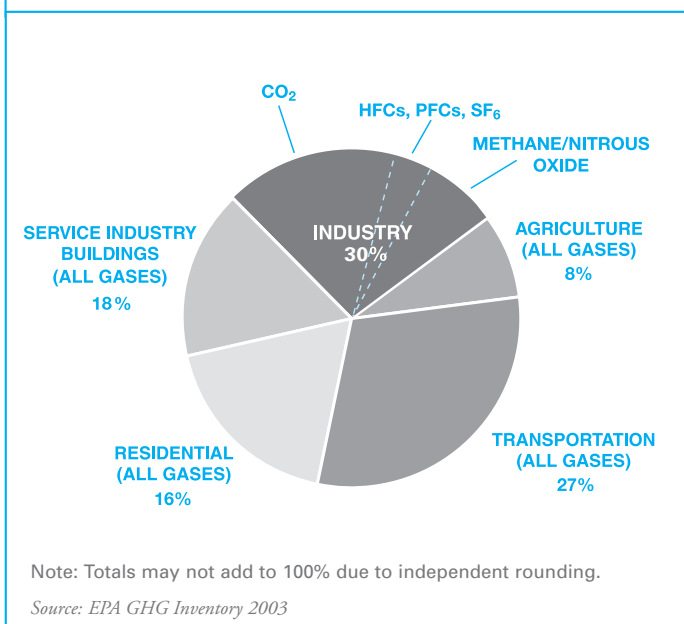
This annual report presents the environmental and economic benefits from EPA’s climate protection partnerships through the end of 2002. The next section includes descriptions of each program, covering the rationale for each, the accomplishments of 2002, and goals for the future. The final section summarizes the successes of the CPPD programs during their first decade. It quantifies the greenhouse gas emissions that the programs have avoided and the energy and monetary savings that have accrued to partners and consumers.

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

FIGURE 5.
U.S. greenhouse gas emissions by sector



“To achieve this goal, our nation must move forward on many fronts, looking at every sector of our economy. We will challenge American businesses to further reduce emissions We will build on these successes with new agreements and greater reductions.”

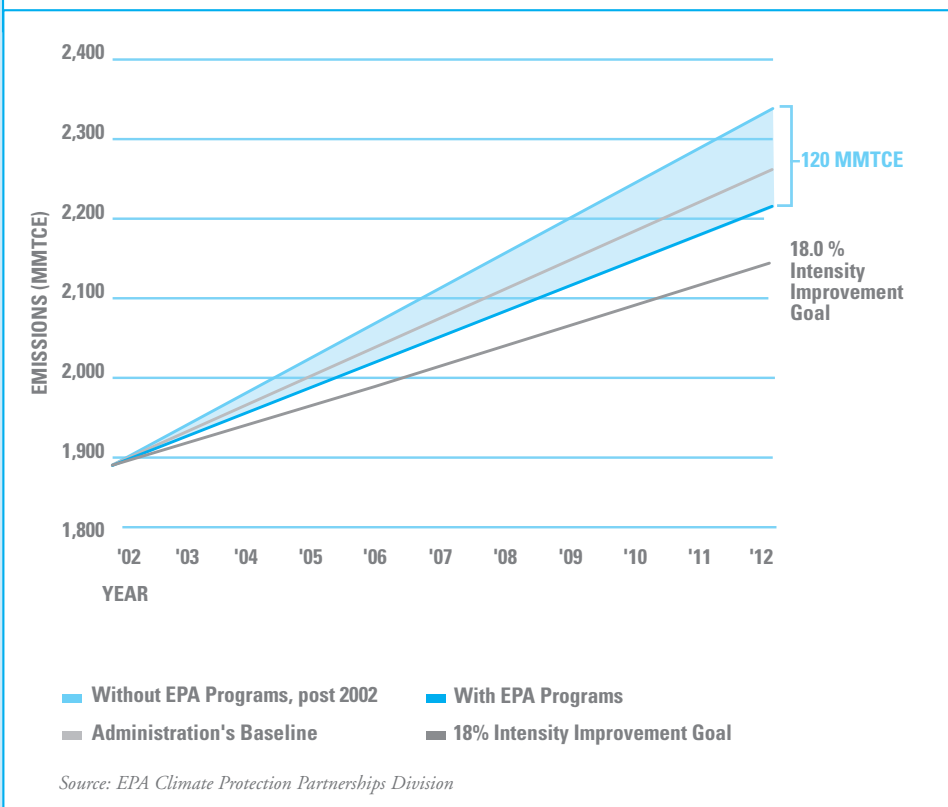
—President George W. Bush, February 14, 2002

In February 2002, President Bush announced an aggressive strategy to reduce greenhouse gas intensity by 18 percent by 2012.⁵ By significantly slowing the growth in greenhouse gas emissions, this policy will put America on a path toward stabilizing concentrations of greenhouse gases for the long term, while sustaining the economic growth needed to finance investments in a new, cleaner energy structure.

The Bush Administration is strengthening and expanding EPA’s voluntary programs as a key strategy for achieving the intensity reduction goal. Many industries have already responded to the new challenge to reduce their greenhouse gas emissions voluntarily wherever possible.

EPA’s voluntary climate protection programs will contribute a reduction of 45 million metric tons of carbon equivalent (MMTCE) annually to the President’s 18 percent intensity reduction goal by 2012, in addition to contributing 75 MMTCE to the Administration’s baseline projection. In total, EPA’s programs will contribute 120 MMTCE by 2012, as illustrated in Figure 6. These avoided emissions are in addition to the 65 MMTCE avoided annually as of 2002 (not shown in Figure 6).

FIGURE 6.
Projected reductions in GHG emissions due to Administration Climate Policy



This annual report provides a summary, update, and outlook for many of the EPA programs that are expected to deliver these results. The other EPA programs that contribute to these results primarily address transportation issues, such as Smart Way, and can be found at www.epa.gov/air/transport.

⁵Greenhouse 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>.



ENERGY STAR PROGRAM

ENERGY EFFICIENCY IS A SMART INVESTMENT

Energy efficiency is well recognized for providing many benefits. These include:

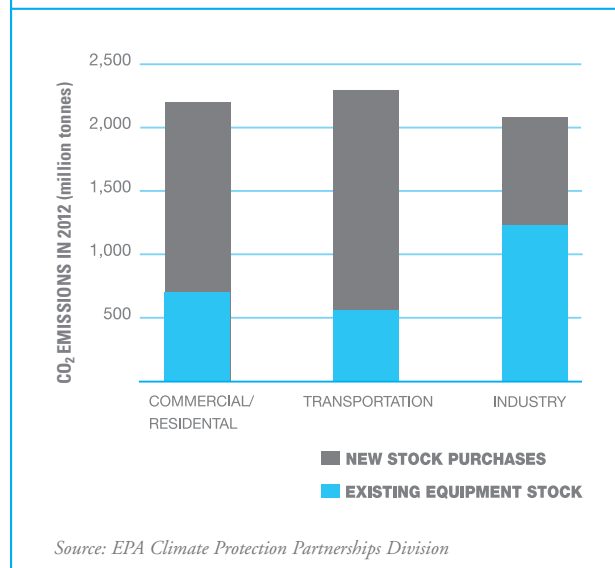
Cost savings. American families and businesses spend \$700 billion each year on energy bills—about the same as is spent on education. Energy efficiency offers great potential for reducing these energy costs. Many homeowners and businesses could use 20 to 30 percent less energy, without sacrificing features or comfort, through attractive investments in products and services.

Greenhouse gas reductions. More than 50 percent of the projected national energy use and CO₂ emissions 10 years from now will come from the use of equipment purchased between now and then (see Figure 7). Promoting more efficient options could reduce greenhouse gas emissions substantially as equipment is naturally retired or replaced.

Energy reliability. By reducing demand, energy efficiency is a low-cost (2–3 cents/kWh) contributor to system adequacy—the ability of the electric system to supply the aggregate energy demand at all times—because it reduces the base load as well as the peak power demand. This reduction in peak power demand can also contribute to system security—the ability of the system to withstand sudden disturbances—by reducing the load and stress at various points in the power distribution system, thereby decreasing the likelihood of failures.

Energy security. Between 1973 and 2000, U.S. dependence on foreign oil rose from about 35 percent to more than 52 percent of U.S. consumption. During the same period, the import share of natural gas rose from less than 5 percent to more than 15 percent and continues to rise. Energy efficiency and the use of renewable energy are environmentally sound ways to reduce foreign oil and gas imports and to moderate the effects of energy price spikes.

FIGURE 7. More than 50% of projected energy use 10 years from now will come from equipment purchased between now and then



The potential of energy efficiency is not being fully realized nationwide for a variety of reasons. With relatively low energy prices in the United States, many organizations have focused much less on energy efficiency improvements and much more on improvements in labor or capital productivity. While many businesses and homeowners express interest in making energy efficiency investments for their own buildings and homes, they do not 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.

ENERGY STAR PROGRAM



ENERGY STAR

The lack of answers to important questions about energy efficiency shows a large information gap. The ENERGY STAR program seeks to fill this gap and enable businesses, organizations, and consumers to realize the cost savings and environmental benefits of energy efficiency investments through a straightforward, market-based approach:

- Use the ENERGY STAR label to clearly identify which products, practices, new homes, and buildings are energy efficient—offering lower energy bills and environmental benefits.
- Empower decision makers by making them aware of the benefits of products, homes, and buildings that qualify for ENERGY STAR and by providing energy performance assessment tools and project guidelines for efficiency improvements.
- Work with retail and service companies in the delivery chain so they can easily offer energy-efficient products and services.
- Partner with regional, state, and local organizations running energy efficiency programs so these programs leverage the national energy efficiency specifications and public awareness of ENERGY STAR and thus achieve more with their resources.



Introduced by EPA in 1992 for energy-efficient computers, the ENERGY STAR label has been expanded to more than 35 product categories. Since the mid-1990s, EPA has collaborated with the U.S. Department of Energy (DOE), which now has responsibility for certain product categories. Efficient new homes became eligible for the label in 1995. Efficient buildings became eligible for the label in 1999 when EPA unveiled a new standardized approach for measuring the efficiency (or energy performance) of an entire building.

The economic and environmental benefits of ENERGY STAR through the year 2002 are already substantial. More than one billion ENERGY STAR qualified products have been purchased and billions of square feet of building space improved. The results across the ENERGY STAR program in terms of energy saved and greenhouse gas emissions avoided in 2002 are provided in Table 3. Additional program achievements within the residential, commercial, and industrial sectors are presented in the sections beginning on page 12.

The ENERGY STAR label is being adopted in countries around the world. International agreements allowing the implementation of energy efficiency programs modeled after ENERGY STAR are currently in place with Canada, the European Community, Japan, Taiwan, Australia, and New Zealand.

More than one billion ENERGY STAR qualified products have been purchased to date.

“By working with the ENERGY STAR program, we have been able to educate Kentuckians about affordable and energy-efficient options that save money while protecting the environment.”

—John Davies, Director
Kentucky Division of Energy, ENERGY STAR Award Winner

TABLE 3.
ENERGY STAR Program: annual goals and achievements

	2002				2003	
	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	85.0	104.6	20.3	25.2	95.0	22.5
Commercial/Residential Buildings Total	—	104.6	17.0	21.5	—	19.2
Qualified Products Subtotal ¹	—	57.3 ²	9.5	11.9	—	10.6
Computers	—	5.5	—	1.1	—	—
Monitors	—	20.7	—	4.2	—	—
Printers	—	7.8	—	1.6	—	—
Copiers	—	1.5	—	0.3	—	—
Other Office Equipment	—	7.2	—	1.5	—	—
Lighting	—	4.8	—	1.0	—	—
Home Electronics	—	4.6	—	0.9	—	—
Other Products	—	5.2	—	1.3	—	—
Building Improvements Subtotal ³	—	47.3	7.5	9.6	—	8.5
Industrial Improvements Total ⁴	—	—	3.3	3.7	—	3.3

¹ Results for qualified products from Webber et al., 2003.

² The kWh savings imply peak demand savings of more than 16 gigawatts (GW), based on conservation load factors developed by LBNL (Koomey et al., 1990).

³ Results for building improvements from Horowitz, 2001.

⁴ Results for industrial improvements from Dutrow, 2003.

Totals may not equal sum of components due to independent rounding.

— : Not applicable

EASTMAN KODAK COMPANY

Rochester, New York



Eastman Kodak Company, a leader in the creation and use of images in the photography, health, and commercial markets, is also a leader in practicing and promoting energy efficiency. Its corporate commitment to continually improve energy performance spans both operations and product lines. Eastman Kodak's world class energy team has top-level company commitment as demonstrated through its robust energy policy and aggressive energy and carbon dioxide reduction goals, which are tracked monthly. The energy team, working together with the basic manufacturing operations, implements a strategic energy management plan that has already saved more than \$8.5 million in operating costs and enough energy to operate all of its plants worldwide for a full month, reducing carbon dioxide emissions equivalent to planting more than 200,000 acres of trees. Eastman Kodak also produces and sells more than 20 ENERGY STAR qualifying product lines including copiers, printers, and scanners. **(For a complete list of ENERGY STAR Award Winners for 2002, see page 21.)**

ENERGY STAR PROGRAM



ENERGY STAR IN THE RESIDENTIAL SECTOR

ENERGY STAR continues to grow as a powerful platform for delivering energy efficiency to homeowners across the country. Major highlights of 2002 include:

Building and expanding partnerships with manufacturers to add new products that can earn the ENERGY STAR label. EPA is committed to updating performance specifications for products in cases where technology has advanced and updates are necessary to maintain the integrity of ENERGY STAR. In 2002, EPA updated the specifications for televisions/VCRs, residential air-conditioning/heat pumps, and residential light fixtures. By the end of 2002, more than 1,250 manufacturers were ENERGY STAR partners, using the label on more than 18,000 product models.

Building consumer awareness of the ENERGY STAR label as the national, government-backed symbol for energy efficiency. Recent surveys, including a 2002 household survey

sponsored by the Consortium for Energy Efficiency, show that more than 40 percent of consumers nationwide recognize the ENERGY STAR. In addition, a majority of consumers report that the label influenced their purchasing decisions, and more than 70 percent would recommend ENERGY STAR to a friend. In early 2002, EPA launched a new national campaign to help increase this awareness, which through the year proved very successful. The campaign garnered over \$10 million in equivalent ad value and more than 30,000 airings in its first 12 months. Ads for television, radio, and print consistently outperformed the government benchmark. The campaign encourages Americans to help protect the environment by changing today to energy-efficient products and practices. The message is an easy one: Look to ENERGY STAR to make a change. By using ENERGY STAR to increase energy efficiency at home and at work, each of us can make a difference now and for the future.

Expanding the use of the ENERGY STAR label on efficient new homes.

Homes that earn the ENERGY STAR label provide comfort, value, and savings to homeowners and increased profits for homebuilders, while protecting the environment. In 1995, the ENERGY STAR label became available for new homes that are 30 percent more energy efficient (for heating, cooling, and hot water heating) than homes built to the national model energy



CANON U.S.A., INC.

Lake Success, New York



Canon holds the record for producing the most (cumulative) ENERGY STAR qualified imaging products—279. On top of that, Canon created and placed a \$2 million advertising campaign featuring the benefits of its ENERGY STAR qualifying products in six major newspapers and journals for 15 weeks generating 11 million impressions. Canon continues to heavily market its “Copier of the Future Series,” which surpasses the energy efficiency performance level for ENERGY STAR. Canon also produces extensive internal and external communications materials and training programs. Canon’s Mobile Marketing Vehicle, a 53-foot tractor trailer that travels the country showcasing its ENERGY STAR qualifying line, as well as other Canon products, is just one example. *(For a complete list of ENERGY STAR Award Winners for 2002, see page 21.)*

ENERGY STAR TOPS 100,000 NEW HOMES IN 2002

On May 6, 2003, former EPA Administrator Christine Todd Whitman announced to the National Association of Home Builders at its annual executive meeting in Washington, DC, that more than 100,000 new homes had earned the ENERGY STAR label for superior energy performance. When EPA began working with homebuilders 7 years ago, only 55 homes in the United States were ENERGY STAR qualified. Now more than 3,000 builders in all 50 states build ENERGY STAR qualified homes. In the past few years, the growth of ENERGY STAR homes has been exponential, with the number of qualifying homes doubling every year since 2000. ENERGY STAR continues to prove that incorporating energy efficiency into home building is good for business and the environment.

Each ENERGY STAR qualified home keeps 4,500 pounds of greenhouse gases out of our air every year and saves homeowners about \$200–\$400 annually on their utility bills. By conserving more than 180 million kW of electricity, these homes also save Americans more than \$26 million in energy costs per year.

code. Since then, more than 3,000 builders have joined ENERGY STAR—including one-third of the top builders in the country. The number of ENERGY STAR qualified new homes increased from 57,000 homes at the end of 2001 to more than 110,000 qualified homes by the end of 2002 (see sidebar above). The recent rapid growth in the number of qualified new homes is due in part to the adoption of ENERGY STAR by utilities in Texas and California—states with a large number of housing starts. ENERGY STAR has achieved market penetration of up to 20 percent in key areas such as Phoenix and Las Vegas, and cities in Texas and California are likely to follow suit. New Jersey, New England, and the Midwest also have large concentrations of ENERGY STAR qualified homes. In addition, the Army Corps of Engineers now builds all new Army homes as ENERGY STAR.

Developing home improvement opportunities beyond labeled products. In 2002, EPA continued its work in residential efficiency improvements, promoting a program for whole-house improvement called Home Performance with ENERGY STAR. This approach was launched in 2001 through the New York State Energy and Research Development Authority (NYSERDA) and the Wisconsin Energy Conservation Corporation (WECC). It uses performance-based building science techniques to maximize quality, consistency, and effectiveness of energy efficiency improvements in existing homes. In 2002, four utilities in the Northeast and two non-governmental organizations also adopted Home Performance with ENERGY STAR and began implementing their programs. In addition, Home Performance with ENERGY STAR will get a boost from the \$500,000 made available to five additional metropolitan areas from DOE.



CLAYTON HOMES, INC.

Maryville, Tennessee



Clayton Homes is the nation's first manufactured housing builder to certify all 20 of its plants to be capable of producing ENERGY STAR qualified homes. By so doing, Clayton Homes can now manufacture more than 20,000 ENERGY STAR ready homes per year, available across 33 states. Clayton Homes has also developed innovative point-of-sale educational materials, signage, and technology displays to communicate the value of ENERGY STAR to consumers. *(For a complete list of ENERGY STAR Award Winners for 2002, see page 21.)*

ENERGY STAR PROGRAM



In 2002, EPA also supported the growing number of professionals trained to understand how parts of the home work together to maintain comfort while reducing energy use and energy bills. Through ENERGY STAR Home Sealing, contractors and homeowners are learning about the need to seal air openings to the outside while properly insulating walls and attics. When combined with ENERGY STAR qualified windows, this sealed “home envelope” keeps conditioned air within the living space. Key parts of the heating and cooling system must be tuned to the manufacturer’s specified operating conditions to ensure peak equipment efficiency. EPA’s seasonal ENERGY STAR Cool Change Campaign promotes this “systems” approach for heating and cooling systems. Large retailers such as Lowes and Sears are helping EPA get this ENERGY STAR message out to homeowners. In 2002, Steve Thomas, long-time host of “This Old House,” appeared as an ENERGY STAR spokesman at major consumer trade shows to promote EPA’s home improvement program. Also, EPA actively supports the North American Technician Excellence (NATE) organization, which tests HVAC contractors on proper installation, maintenance, and service of heating and cooling equipment.



Highlighting and promoting ENERGY STAR labeled products in retail stores and through key state-level energy efficiency programs. In 2002, EPA worked with more than 160 utilities and state or regional energy efficiency programs, which serve nearly 60 percent of the households in the United States, to promote energy efficiency through ENERGY STAR. More than 50 of them encouraged the construction of ENERGY STAR qualified homes as part of their residential programs. EPA also partners with more than 400 retailers in promoting ENERGY STAR qualified products in more than 20,000 storefronts across the country.

LENNOX INDUSTRIES INC.

Richardson, Texas



A leading manufacturer of commercial and residential heating and cooling systems, Lennox has made a corporate commitment to deliver high-quality, energy-efficient heating and cooling to customers throughout the United States. By consistently incorporating the ENERGY STAR logo into its advertising, as well as using ENERGY STAR messages, Lennox has helped make consumers aware of the environmental and economic benefits of high-efficiency heating and cooling systems. Lennox also contributed to the success of the 2002 ENERGY STAR Cool Change campaign with its enthusiastic participation. Through its actions and leadership in promoting highly efficient heating and cooling systems, Lennox has proven itself an industry champion. *(For a complete list of ENERGY STAR Award Winners for 2002, see page 21.)*

“Lowe’s customers are asking for products that give them value. ENERGY STAR qualified products save consumers money, offer the same or better features as standard models, and are good for the environment. To our customers, that is value.”

*—Dale Pond, Senior Executive Vice President of Merchandising/Marketing
Lowe’s Companies Inc., ENERGY STAR Award Winner*

In 2003, EPA will:

- Update performance specifications for computer monitors, imaging equipment, ventilation fans, and ceiling fans. EPA will also add new products and services to the ENERGY STAR family.
- Continue to build consumer awareness of the ENERGY STAR label, particularly through product-focused national campaigns for lighting products, home electronics, and heating and cooling equipment, with the goal of raising awareness of the label to more than 60 percent over the next several years.
- Work with home builders and champions to build, test, and label 75,000 new homes as ENERGY STAR, by expanding the outreach partnership to 12 metropolitan areas and building upon EPA’s manufactured housing alliance.
- Support Home Performance with ENERGY STAR in Austin, TX; Kansas City, MO; San Jose and Fresno, CA; and New England, as well as the DOE grantees located in Atlanta, GA; Birmingham, AL; Atlantic City, NJ; St. Louis, MO; and Boise, ID.
- Expand home improvement programs to promote in-home services such as ENERGY STAR Home Sealing, duct sealing, and proper installation and maintenance of heating and cooling equipment. One key component will involve increasing the number of trained contractors to perform these services. ENERGY STAR will continue to work closely with the Building Performance Institute and NATE to expand the number of qualified technicians who understand energy efficiency and the advantages of ENERGY STAR.
- Work with retail partners, utilities, and states in broad consumer promotions of ENERGY STAR qualified products and new homes.

LOWE’S HOME IMPROVEMENT WAREHOUSE

Wilkesboro, North Carolina



This year, the 7 million customers a week that shop at Lowe’s 800 home improvement stores in 43 states are more likely than ever to save money and help protect the environment by taking home an ENERGY STAR qualifying product. Lowe’s continues to teach consumers about ENERGY STAR through in-store promotions, the Lowe’s ENERGY STAR Solutions Guide, informed sales staff, and specialized educational clinics about ENERGY STAR. In 2002, ENERGY STAR qualified products offered by Lowe’s increased 30 percent over the prior year, resulting in a 39-percent increase in sales of qualifying products. Sales staff are better prepared to close the sale for energy efficiency—100 percent of employees have been educated about ENERGY STAR. The company has integrated ENERGY STAR education into every sales associate training venue, including collateral, intranet, broadcast (Business Television), and corporate wide communiqués (Lowe Down). Customer interest in ENERGY STAR is generated by a dedicated ENERGY STAR on-line shopping center; incorporating messages on the economic and environmental benefits of ENERGY STAR qualifying products in all consumer advertising (including weekly TV ads airing on HGTV, generating 143 million impressions for ENERGY STAR in 2002); and specialized public relations activities, such as the laundry room make over, featuring an ENERGY STAR qualifying clothes washer on *Ron Hazelton’s HouseCalls* (ABC).

What does Lowe’s plan to do to top all that? Lowe’s has announced a corporate commitment to increase sales of ENERGY STAR qualifying products by another 20 percent in 2003, is pursuing benchmarking and improving the efficiency of its own facilities with ENERGY STAR tools, and has become the first home improvement retailer to join EPA’s Green Power Partnership. *(For a complete list of ENERGY STAR Award Winners for 2002, see page 21.)*

ENERGY STAR PROGRAM



ENERGY STAR IN THE COMMERCIAL SECTOR

In 2002, EPA continued to promote a strategy for superior energy management to businesses and other organizations that starts with the top leadership, engages the appropriate employees throughout the organization, uses standardized measurement tools, and helps an organization prioritize and get the most from its efficiency investments. Major highlights of 2002 include:

Encouraging Top-Level Commitment to Energy Efficiency. Top-level organizational commitment has proved to be the catalyst for energy efficiency investments in many of the most successful ENERGY STAR partner organizations. Without this commitment, resources are often not allocated to energy projects, and efficiency programs are not sustained.

- Nearly 12,000 organizations have partnered with EPA in the pursuit of superior energy management.
- ENERGY STAR partners represent more than 12 billion square feet and approximately 17 percent of the commercial building market.

Success with Superior Energy Management. EPA continued to offer its proven energy management strategy to ENERGY STAR partners. Based on building science, this strategy helps organizations achieve twice the savings for a given level of investment as traditional methods. It includes a 5-stage approach to building upgrades, which encompasses recommendations for building tune-up, product procurement, and capital-intensive projects.

- EPA estimates that to date more than 47.5 billion kWh have been saved through these efforts.
- More than 2,260 additional small businesses looked to ENERGY STAR to help them find opportunities to save energy and reduce the cost of operating their businesses.
- Restaurant and hotel companies worked with EPA to develop procurement policies to expand the purchase of ENERGY STAR qualified products.

POUDRE SCHOOL DISTRICT

Fort Collins, Colorado



Since the Poudre School District Board of Education adopted an Energy Conservation Policy in 1996, the school district has developed short- and long-term strategies to increase energy awareness and efficiency in facility management and curriculum development. The District tracks all of its utility expenditures and notes changes on a monthly basis. In 2002, 10 additional schools surpassed ENERGY STAR performance levels, doubling the total number of ENERGY STAR qualifying schools, which now comprise more than 40 percent of the District's school portfolio. To demonstrate its commitment to continuous improvement, Poudre has documented an average increase across its 47 benchmarked schools from a score of 61 to 66 in the past year, equivalent to a 7-percent energy reduction district wide. Facility representatives present the ENERGY STAR label directly to the custodial staff and Principal, and often the Principal holds an assembly to announce the school's achievement. As an incentive to school staff to do their part to reduce energy by 10 percent, the District provides energy rebates that channel savings back to the school for education. **(For a complete list of ENERGY STAR Award Winners for 2002, see page 21.)**

“We are proud to make the environment and energy management an organizational priority, and the ENERGY STAR program is good for our bottom line and good for the environment.”

*—John Lembo, Director of Energy
Starwood Hotels North America Division, ENERGY STAR Award Winner*

- More than 55 organizations participated in the Million Monitor Drive to enable the power management features on more than one million computer monitors, saving 2 million kWh and \$14 million annually.

Building the Financial Case. To help top-level managers see the link between effective energy management and their core objectives, EPA:

- Collaborated with Innovest, a financial analysis firm, whose studies of companies in the retail, food, merchandising, and real-estate sectors determined that firms with effective corporate energy management plans in place outperformed their competitors by 20 to 30 percent on Wall Street, adding to a growing body of evidence that superior energy management is good business.
- Released a Cash Flow Opportunity calculator that estimates how much new energy-efficient equipment can be purchased from the anticipated energy savings, and compares the cost and benefits of financing the project now versus waiting for a lower interest rate or until cash is available in a future budget. This tool has been particularly useful to governments and schools for evaluating alternative financing.
- Updated a Financial Value calculator to estimate the impact of energy savings, real or estimated, on a company’s net income and earnings per share.

Promoting Market Adoption of New Standardized

Measurement Tools. EPA’s national energy performance rating system for buildings, launched in 1999, measures how well the systems of a building are integrated and how well the building is operated and maintained. By comparing the energy use of an individual building against the national stock of similar buildings using an objective 1 to 100 point rating system, it fills an important measurement gap. No consistent or comparable metric existed prior to EPA’s system. It has also helped demonstrate that building energy use can vary by 400 percent between the top performing and worst performing buildings.

- Through 2002, more than 3,500 active accounts were set up in Portfolio Manager, the online software tool that allows building managers to generate their building’s energy performance score.



- More than 15,000 buildings, representing 2.5 billion square feet (or 14 percent of the total eligible market) have had their performance rated. This total includes 16 percent of office buildings, 13 percent of schools, 20 percent of supermarkets, 21 percent of hospitals, and 5 percent of hotels.
- In 2002, the energy performance rating became available for hotels. Adding that to office buildings, schools, hospitals, and supermarkets, EPA now provides the commercial market with the capability to rate buildings representing more than 40 percent of the sector’s carbon emissions.
- A study conducted by the New Buildings Institute in 2002 reported favorably on ENERGY STAR’s energy performance rating system, confirming that it accurately accounts for changes in energy use related to the installation of energy efficiency measures.
- Major partner organizations, such as Arden Realty, Inc., Food Lion, Hines, Starwood Hotels, and USAA Real Estate Company, have adopted the national rating system as part of their energy management efforts to help them direct their project investments and monitor progress.

ENERGY STAR PROGRAM



- Two of the nation's largest institutional investors, the pension fund TIAA-CREF and the real estate asset manager Lend Lease, announced that they are requiring managers of the buildings in their portfolios to rate the energy performance of these buildings and work to improve their performance.

Providing Recognition for the Top Performing Buildings. Based on results from the national energy performance rating system, EPA offers the prestigious ENERGY STAR label as a way to distinguish buildings that are top energy performers—those that score in the top 25 percent while meeting industry standards for indoor air quality. As a group, the ENERGY STAR qualifying buildings use 40 percent less energy than the average building in the United States while providing quality space.

- In 2002, four hotels earned the ENERGY STAR.
- Through 2002, more than 1,100 buildings earned the ENERGY STAR.

Expanding Partnerships with Interested Organizations. In 2002, EPA continued to collaborate with a number of interested organizations to provide clear, accurate information to energy end-users about opportunities for improved energy performance. These organizations include energy service providers, utilities, state energy groups, and public benefits funds administrators. EPA provides them with training and outreach materials to use in their own energy efficiency programs.

- More than 500 companies that sell energy-efficient building products or provide services are bringing energy efficiency to their customers through ENERGY STAR. In 2002, these companies helped their customers rate more than 1,000 buildings, qualifying 175 of them as ENERGY STAR.

USAA REAL ESTATE COMPANY

San Antonio, Texas



USAA Real Estate Company is the investor, owner, and manager of real estate for its parent organization, USAA, a worldwide insurance and diversified financial services association. USAA Real Estate Company enhances the value of its investment portfolio through hands-on, intensive, creative, and service-oriented property management. USAA joined ENERGY STAR in 2001, benchmarked 100 percent of its eligible portfolio by early 2002, and qualified almost half of those properties for the ENERGY STAR label. In practicing its organization-wide commitment to improved energy performance, USAA worked with ENERGY STAR to create an in-house training program for building managers, customized an energy strategy to guide their efforts, and introduced ENERGY STAR benchmarking requirements to their national operating engineering service providers. The strategy included cost and use monitoring, energy efficiency retrofits, physical audits of properties, and a national approach to energy procurement. USAA also introduced an aggressive campaign to communicate the value and benefit for tenants due to the company's energy efficiency efforts. USAA improved the energy performance of its portfolio by 5 percent in the past year and is successfully translating energy performance improvements directly to the bottom line. One example is a property in California that sold for an additional \$1.5 million. USAA attributes the increased sale price to energy saving retrofits and procured power that translate into reduced operating costs and higher net operating income. *(For a complete list of ENERGY STAR Award Winners for 2002, see page 21.)*

“The ENERGY STAR program challenges property managers to operate our buildings more efficiently, while maintaining the highest standard of quality and service to our tenants.”

*—Jeffrey C. Hines, President
Hines, ENERGY STAR Award Winner*

- Some 20 utilities, states, and regional energy efficiency program managers integrated ENERGY STAR into their activities to reduce energy use in the commercial sector. For instance, Michigan, Minnesota, and Illinois provided benchmarking assistance and promotions to schools and businesses.
- Over 75 architects and engineers were trained to use Target Finder, an EPA Web-based tool that estimates how well a new design will perform compared to similar buildings already in operation. Target Finder helps close the gap between the design intent and the actual energy performance of a building.
- The first working prototype for hosting EPA’s energy performance rating system was demonstrated on energy information services’ Web sites, with the goal of making it easier for companies to benchmark their customers’ facilities using their own energy tracking software.

In 2003, EPA will:

- Add three commercial kitchen products and vending machines to the list of products that are eligible for the ENERGY STAR.
 - Expand the energy performance rating system to include additional commercial building types, such as retail building spaces, residence halls, post offices, warehouses, courthouses, and banks. At that point, the rating system will apply to more than 50 percent of the building space across the country.
 - Continue to work with building owners and managers to improve the energy performance of their portfolios through systematic, cost-effective upgrades. While EPA will partner with any interested organization, special focus will be placed on the sectors for which EPA has developed new standardized measurement tools—commercial real estate, public buildings, schools (K-12), higher education, healthcare, and hospitality.
 - Continue to offer the ENERGY STAR label for top performing buildings and work with organizations to help them highlight the design, operations, and maintenance features that make the buildings qualify.
- Increase recognition opportunities for ENERGY STAR partners by honoring organizations that baseline their organization-wide energy use and achieve 10 percent, 20 percent, and 30 percent reductions.
 - Expand the participation of energy efficiency program sponsors and service and product providers to bring EPA’s energy management strategy and energy performance rating system to more of the commercial market. It is these organizations that have frequent and direct contact with the end-users.
 - Collaborate with leaders in the Green Buildings Industry to ensure that similar approaches are used to recognize top energy performing buildings in the ENERGY STAR program as are used for green building certification.



ENERGY PERFORMANCE INDICATOR (EPI)

The Energy Performance Indicator (EPI) enables companies to compare the relative energy performance of their manufacturing plant(s) against the performance of facilities in the same sector using an objective 1 to 100 point rating system. Using the EPI, an energy manager can compare plants that may have different processes, operating characteristics, or products and assess how the energy performance of those plants relates to that of the industry. Through statistical analysis of plant-level data, the EPI benchmarks energy use per unit of product (e.g., Btu per vehicle manufactured) and adjusts for the factors that influence energy use in plants. For many companies, the EPI provides the first opportunity to externally benchmark and compare energy performance in the industry.

ENERGY STAR IN THE INDUSTRIAL SECTOR

Through ENERGY STAR, EPA is helping manufacturers identify the best in energy performance for their organizations, assisting them to develop a strategic approach to energy management built on the principles of organizational commitment and continuous improvement. A strong corporate energy management program with sustained improvement and decisionmaking leads to a better environment and the financial health of its partners. Integral to this support, ENERGY STAR convenes Industry Focuses. An Industry Focus is a targeted effort to improve energy efficiency within a specific manufacturing sector. Industry Focuses create momentum for continuous improvement in energy performance, provide the industry's energy managers the tools they need to achieve greater success in their energy management programs, and create a supportive environment where energy efficiency ideas and opportunities are shared. In 2002, EPA initiated several Industry Focuses, including the development of Energy Performance Indicators (EPI) for these industries, enhanced networking opportunities for partners from all sectors, and supported the industries in their efforts to strategically manage energy.

In 2002, EPA:

- Strengthened partnerships with U.S. manufacturers, including those from the automobile, pharmaceutical, petroleum, and aerospace industries.
- Collaborated with the automobile industry to create an EPI—a tool that allows companies to measure and assess the energy performance of vehicle assembly plants. It provides managers a way to benchmark against their peers, track improvement over time, and prioritize efforts and resources.
- Created opportunities for partners to share effective energy management strategies and to improve energy efficiency by conducting two in-person networking meetings hosted by EPA and partners and by virtual networking through Web conferences.
- Initiated Industry Focuses with the wet corn milling and cement manufacturing sectors and began developing EPI tools in these industries.
- Convened energy management meetings with the automobile and brewing sectors. Participating companies represented more than 90 percent of the production capacity in each of these sectors.
- Worked with technology, industry experts, and partners to develop energy management guides specific to the automobile assembly and brewing sectors. The guides identify opportunities for increased energy efficiency.

In 2003, EPA will:

- Initiate new Industry Focuses with the petroleum refining and pharmaceutical industries.
- Conduct the second annual ENERGY STAR Automobile Industry Focus meeting in Detroit, Michigan.
- Formalize Guidelines for Energy Management and work with partners to build world-class, strategic, corporate energy programs, helping them achieve superior energy performance.
- Develop new EPI tools for the brewing, corn refining, and cement industries.
- Increase partner networking opportunities and participation by raising the frequency of Web conferencing events and expanding discussion topics.



ENERGY STAR AWARD WINNERS FOR 2002

CORPORATE COMMITMENT

Eastman Kodak Company
Rochester, NY

PARTNER OF THE YEAR RETAILER

Lowe's Home Improvement
Warehouse
Wilkesboro, NC

PARTNER OF THE YEAR PRODUCT MANUFACTURERS

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

JELD-WEN inc.
Klamath Falls, OR

Lennox Industries Inc.
Richardson, TX

Maytag Corporation
Newton, IA

Panasonic
Secaucus, NJ

SYLVANIA
Danvers, MA

ENERGY STAR NATIONAL PRODUCTS PROMOTION AWARD

Midwest Energy Efficiency
Alliance
Chicago, IL

Westinghouse Lighting
Corporation
Philadelphia, PA

Wisconsin Energy
Conservation Corporation
Madison, WI

PARTNER OF THE YEAR NEW HOMES

Astoria Homes
Las Vegas, NV

California ENERGY STAR New
Homes Program:

Pacific Gas and Electric Co.
San Francisco, CA

San Diego Gas and Electric
San Diego, CA

Southern California Edison
Rosemead, CA

Southern California Gas Co.
Los Angeles, CA

CenterPoint Energy
Houston, TX

Clayton Homes, Inc.
Maryville, TN

Energy Sense
Houston, TX

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

Oncor Electric Delivery Company
Dallas, TX

Pardee Homes
Los Angeles, CA

AFFORDABLE HOUSING AWARD

U.S. Department of Housing
and Urban Development
Washington, DC

EXCELLENCE IN HOME IMPROVEMENT

New York State Energy Research
and Development Authority
Albany, NY

EXCELLENCE IN BUSINESS AND INSTITUTIONAL OUTREACH

American Society for Healthcare
Engineering of the American
Hospital Association
Chicago, IL

LEADERSHIP IN ENERGY MANAGEMENT

Dutchess Community College
Poughkeepsie, NY

Food Lion, LLC
Salisbury, NC

Hines
Houston, TX

Poudre School District
Fort Collins, CO

Raytheon Company
Lexington, MA

Starwood Hotels & Resorts
Worldwide, Inc.
White Plains, NY

USAA Real Estate Company
San Antonio, TX

EXCELLENCE IN ENERGY SERVICES

Servidyne Systems, LLC
Atlanta, GA

LEADERSHIP IN ENERGY EFFICIENCY

Kentucky Division of Energy
Frankfort, KY

Sponsoring Organizations
of NEEP
Lexington, MA

Northwest Energy Efficiency
Alliance
Portland, OR

Southern Minnesota
Municipal Power Agency
Rochester, MN

State of California: Flex
Your Power and the
California IOUs:

Pacific Gas and Electric Co.
San Francisco, CA

San Diego Gas and Electric
San Diego, CA

Southern California Edison
Rosemead, CA

Southern California Gas Co.
Los Angeles, CA

Wisconsin ENERGY STAR
Homes/Focus on Energy
Madison, WI

SPECIAL RECOGNITION: EXCELLENCE IN ENVIRONMENTAL EDUCATION

CNN
Atlanta, GA

Fox News Channel
New York, NY

Home & Garden Television
(HGTV)
Knoxville, TN

KLAS-TV
Las Vegas, NV

Today's THV
Little Rock, AR

WCFN UPN 49
Champaign, IL

WITN-TV
Washington, NC

SPECIAL RECOGNITION: ENERGY STAR NEW HOMES OUTREACH

Las Vegas Breakfast Club
Las Vegas, NV

SPECIAL RECOGNITION: ENERGY STAR MILLION MONITOR DRIVE

America Online, Inc.
Dulles, VA

Cisco Systems
San Jose, CA

Citigroup
New York, NY

Computer Associates
Islandia, NY

Computer Sciences
Corporation
El Segundo, CA

Harvard University FAS CERP
Cambridge, MA

John F. Kennedy School of
Government
Cambridge, MA

County of Loudoun
Leesburg, VA

Pitney Bowes Inc.
Stamford, CT

Watt Watchers of Texas
El Paso, TX



CLIMATE LEADERS

Leading companies across industrial sectors are working with EPA's Climate Leaders Program to develop long-term climate change strategies. Climate Leaders partners set a corporate-wide greenhouse gas reduction goal and conduct regular inventories of their emissions to measure progress. This type of greenhouse gas management strategy positions Climate Leaders Partners as corporate environmental leaders and helps them mitigate possible carbon risk as the climate change debate unfolds.

In 2002, its first year, Climate Leaders welcomed 34 companies as partners. By year end, seven companies announced corporate-wide greenhouse gas reduction goals. In 2003, Climate Leaders plans to recruit 30 additional businesses and announce 20 corporate greenhouse gas emissions reduction goals.

GREENHOUSE GAS REDUCTION GOALS

- General Motors pledged to reduce total greenhouse gas emissions by 10% for all of its North American facilities from 2000 to 2005.
- Holcim (US) Inc. pledged to reduce greenhouse gas emissions by 12% per ton of cement from 2000 to 2008.
- IBM pledged to achieve (a) average annual CO₂ emissions reductions equivalent to 4 percent of the emissions associated with the company's worldwide energy use and (b) an absolute 10-percent reduction in perfluorocompound emissions from IBM's semiconductor manufacturing processes from 2000 to 2005.
- Miller Brewing Company pledged to reduce greenhouse gas emissions by 18% per barrel of production from 2001 to 2006.
- The National Renewable Energy Laboratory pledged to reduce greenhouse gas emissions by 10% per square foot from 2000 to 2005.
- Norm Thompson Outfitters pledged to reduce greenhouse gas emissions by 90% from 2000 to 2005.
- SC Johnson & Son, Inc., pledged to reduce greenhouse gas emissions by 23% per pound of product from 2000 to 2005.

"We believe that climate change is one of the most serious challenges facing the world today, one that requires immediate action by all parts of society. Our efforts to address this issue have typically led to improved efficiencies and other business benefits. We are honored to join the U.S. EPA Climate Leaders Program to continue our search for solutions. Working together, I believe we can show that climate change is not only a serious problem, but a real business opportunity."

—William R. Blackburn, Vice President and Chief Counsel of Corporate Environment Health and Safety, Baxter International, Inc.



CLEAN ENERGY PROGRAMS

GREEN POWER PARTNERSHIP

A growing number of major companies, universities, government agencies, and others are realizing that they have a choice in the power they consume, and that they can choose cleaner, environmentally beneficial renewable energy.

To take advantage of the pollution prevention opportunity created by the steadily increasing availability of green power, EPA developed the Green Power Partnership, which is working to standardize green power procurement as part of best practice environmental management. Partners commit to procuring green power for a certain percentage of their electricity needs. In return, EPA provides technical assistance and public recognition for environmental leadership.

In 2002, the Green Power Partnership:

- Recruited an additional 70 partners for a total of 93 organizations that have made a combined commitment to purchase more than 580 million kWh of green power annually, including 250,000 MWh from new renewable generation.
- Created a Partner Toolkit of technical resources, including a comprehensive “Guide to Buying and Benefiting from Green Power.”
- Released E-GRID 2001, an update of the existing E-GRID database of air emissions for the U.S. electricity generation industry.
- Provided national recognition to leading green power purchasers through local press events and the national Green Power Leadership Awards.

In 2003, EPA will:

- Recruit 100 additional partners to make commitments to purchase green power.
- Create new resources for partner recognition and technical assistance, including a Web-based tool that allows electricity users to understand the air emissions impacts associated with conventional electricity generation.
- Provide public recognition to partners through regional events as well as the national Green Power Leadership Awards.

2002 GREEN POWER LEADERSHIP AWARDS

In October 2002, the Green Power Partnership, in collaboration with DOE and the Center for Resource Solutions, presented the Second Annual Green Power Leadership Awards to:

Advanced Micro Devices
County of Alameda, CA
Johnson & Johnson
Pennsylvania State University
State of New Jersey
University of Pennsylvania

PARTNER OF THE YEAR

City of Chicago, IL
Kinko's, Inc.

“Renewable energy is a vital component in keeping a city healthy and competitive. The City of Chicago's commitment to the Green Power Partnership is part of our goal to make Chicago the greenest, most livable city in America.”

—Richard M. Daley, Mayor, City of Chicago

“RealEnergy and its customers are committed to doing the right thing when it comes to energy and the environment. Shining a positive light on our customers with public recognition through programs like EPA’s ENERGY STAR CHP Award provides an added incentive to do more of the right thing!”

—Steven A. Greenberg, Chief Operating Officer, RealEnergy, Inc.

COMBINED HEAT AND POWER PARTNERSHIP

EPA’s Combined Heat and Power (CHP) Partnership works with industry, state and local governments, universities, and other institutional users to facilitate the development of clean, efficient CHP projects. In 2002, EPA provided direct assistance to several new CHP projects in the form of permitting assistance, networking, and public recognition. EPA also helped to generate interest in CHP at the state level by co-hosting workshops and outreach events.

In 2002, the CHP Partnership:

- Grew to 74 partners and facilitated 17 new CHP projects that are currently operational or under development, totaling almost 790 MW of new CHP capacity.
- Co-sponsored six CHP workshops in four states.
- Provided public recognition at four projects.
- Launched the CHP Partnership Web site as a one-stop shop for information about CHP project development and the environmental benefits of CHP.
- Worked with regional CHP initiatives to promote CHP in many regions of the country.

In 2003, EPA will:

- Release a Best Practices Guide to output-based air emissions regulations and educate air regulators on innovative ways to recognize the efficiency of CHP.
- Co-sponsor four events in four states.
- Initiate a targeted project development campaign in key industrial sectors, universities, and cities that will result in up to six new CHP projects.
- Add 30 new partners to meet a milestone of 100 and assist CHP partners with up to 15 new projects, facilitating the development of 450 MW of new CHP capacity.
- Present ENERGY STAR CHP awards to two or more projects.

2002 ENERGY STAR COMBINED HEAT AND POWER AWARD WINNER

The University of Michigan

The University of Michigan’s Central Power Plant was originally constructed in 1914. In the early 1990s, the university added two gas turbines to generate more electricity to better meet campus demand. The expanded CHP facility uses 18 percent less fuel than comparable onsite thermal generation and purchased electricity. This project annually reduces carbon dioxide emissions by 85,000 tons, saves enough natural gas to heat 17,000 homes, and reduces nitrogen oxide emissions by 120 tons.

“The objective of the district and its board has been to provide additional renewable energy to our customers in a way that is increasingly efficient and economical. The landfill gas facility has been very productive in a very short time in accomplishing that.”

—Fred Petersen, President, Omaha Public Power District

METHANE PROGRAMS

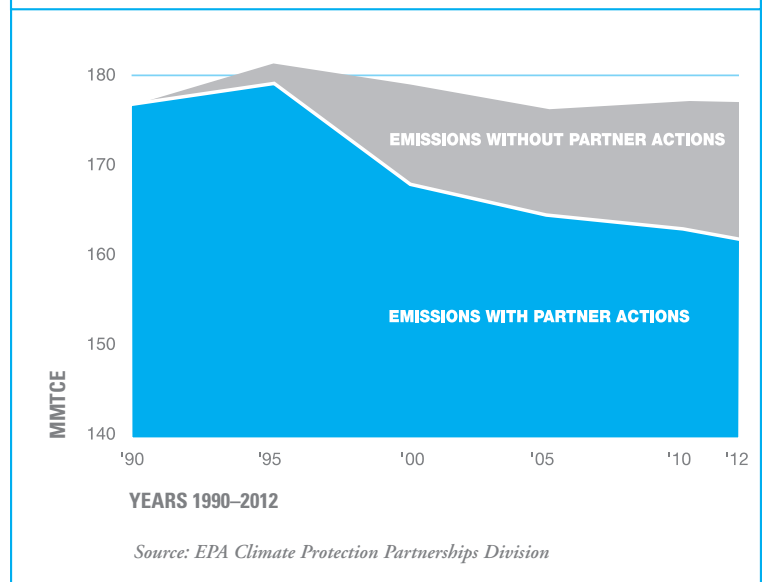
METHANE PROGRAMS

Methane’s contribution to total U.S. greenhouse gas emissions is second only to that of carbon dioxide. Each ton of methane emitted is, however, 21 times more effective at trapping heat in the atmosphere than one ton of CO₂. At the same time, methane is also a valuable source of energy, being the major component of natural gas.

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, which is to provide sound technical, economic, and regulatory information on emissions reduction technologies and practices, as well as tools to facilitate implementation of methane reduction opportunities. Partners profit from their involvement in these programs by making their operations more efficient and their businesses more competitive. EPA also provides information and tools to the agricultural community to encourage methane reductions.

These voluntary partnerships, in conjunction with a regulatory program to limit air emissions from the nation’s largest landfills, reduced national methane emissions to well below 1990 levels in 2002, and they are projected to maintain emissions below 1990 levels through 2012 (see Figure 8).

FIGURE 8. Partner actions are projected to maintain methane emissions below 1990 levels through 2012





LANDFILL METHANE OUTREACH PROGRAM

Landfills are the largest source of U.S. human-related (anthropogenic) methane emissions. Capture and use of landfill gas not only reduces methane emissions directly, but also reduces CO₂ emissions indirectly by displacing the use of fossil fuels. The Landfill Methane Outreach Program (LMOP) encourages landfills across the nation to capture and use their landfill gas emissions as an energy source. Working with landfill owners, state energy and environmental agencies, energy suppliers, industry, communities, and other stakeholders, LMOP lowers the barriers to landfill gas-to-energy project development.

Since the program's launch in December 1994, LMOP has reduced methane emissions from landfills by approximately 14 MMTCE. In addition, the number of landfill gas-to-energy projects has grown to nearly 340. In 2002 alone, the program reduced emissions by 3.9 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 2002, LMOP:

- Assisted in the development of 23 new landfill gas-to-energy projects, with more than 35 additional projects under construction and expected online soon.
- Welcomed 59 new partners, increasing participation by 16 percent and bringing the total number of LMOP partners to 330.
- Awarded two competitive grants designed to spur innovative project development to Raleigh County, West Virginia, and the Northeast Center for Social Issue Studies in Brattleboro, Vermont.

In 2003, EPA will:

- Collaborate with DOE's Federal Energy Management Program, the World Resources Institute's Green Power Market Development Group, and EPA's Climate Leaders Program to engage federal and corporate energy end-users on landfill gas-to-energy project opportunities.
- Release two new landfill gas-to-energy project development tools, *LFGcost* and the *End-User Search Tool*, designed to provide project developers and other parties with comprehensive financial and end-user data.
- Host the 7th Annual LMOP Conference and Project Expo and six state workshops to present the benefits of landfill gas energy, discuss project development activity and opportunities, and address issues affecting landfill gas projects.
- Assist in the development of 25 new landfill gas-to-energy projects.

“The efforts of EnergyXchange have done much for the landfill gas energy field: proven that landfill gas energy projects at small landfills can be beneficial, shown the power of partnerships, drawn nationwide attention to landfill gas energy, spawned development in neighboring areas, and become a model for other projects.”

—Stan Steury, Project Coordinator, Blue Ridge RC&D

**PROJECT OF THE YEAR (TIE):
CITY OF ARLINGTON, TEXAS
LANDFILL GAS ENERGY PROJECT**

Arlington, Texas

This project is a unique alliance among two cities, a public utility, a non-profit environmental foundation, and a private renewable energy company. The Arlington landfill, owned and operated by the City of Arlington, Texas, installed a gas collection system in 1997. Renovar Energy Corp. (Renovar), which operates the landfill's gas collection system, determined that the best landfill gas (LFG) use option would be to construct a 4-mile pipeline to transport the gas to a wastewater treatment plant owned by the City of Fort Worth. The plant generates significant amounts of methane gas on its own from anaerobic sludge digestion, using it to create electricity and heat the digesters. Renovar initiated discussions with Fort Worth to increase electricity generation at the plant by utilizing LFG as a supplemental fuel for two new 5 MW gas turbines. The only feasible pipeline route, however, was through Arlington's River Legacy Park. Renovar worked cooperatively with the local parks departments and conservation organizations to develop a solution for siting the pipeline to avoid a park recreational trail and a number of older trees identified as in need of special protection. This project shows that dedication and cooperative decisionmaking can overcome obstacles to landfill gas-to-energy development.

**PROJECT OF THE YEAR (TIE):
ENERGYXCHANGE RENEWABLE ENERGY
PROJECT**

Burnsville, North Carolina

The EnergyXchange project was initiated when the Blue Ridge Resource Conservation and Development Council performed a study to determine the feasibility of using the LFG from the Yancey-Mitchell Landfill. Blue Ridge formed a task force that identified two community needs: (1) developing new cash crops for local farmers to replace tobacco; and (2) forming a business incubator for “limited resource” potters and glass blowers being

trained in nearby arts and crafts schools. The solution was to form the EnergyXchange Renewable Energy Center, a “campus” of high energy demand facilities adjacent to the landfill that would use the LFG as an energy source. Today, the Renewable Energy Center supports a craft complex of four buildings, including a glass studio, pottery studio, gallery and business/visitor center; several greenhouses growing native plant species; and a fish farming operation. The success of EnergyXchange has been the catalyst for other LFG project development activities in the area. A similar project in Avery County, North Carolina, will use LFG to fuel a large greenhouse, a Regional Forestry & Horticultural Center, and a micro-turbine demonstration project, as well as heating a hangar at a nearby airport.

**ENERGY PARTNER OF THE YEAR:
OMAHA PUBLIC POWER DISTRICT**

Omaha, Nebraska

Headquartered in Omaha, Nebraska, Omaha Public Power District (OPPD) is one of the largest publicly owned electric utilities in the nation and serves more than 280,000 customers in 13 southeast Nebraska counties. Before 2002, OPPD had been looking for a renewable power source and had evaluated solar energy, biomass, and municipal solid waste. The utility identified LFG energy as its most cost-effective, renewable energy option. OPPD built a LFG energy facility at Waste Management Inc.'s Douglas County Recycling and Disposal Facility, which consists of four generating units that provide electricity generating capacity of 3.2 MW. Known as the Elk City Station, the LFG facility has been generating power since April 2002; it was the first LFG project in Nebraska. The project was designed to reduce methane emissions by approximately 6,750 tons annually and initially generate enough electricity each year for 2,000 homes, according to project developers. At maximum landfill gas generation, the project will support a capacity of 30 MW, enough power for 23,000 homes. Using landfill gas will offset the use of approximately 19,000 tons of coal per year that normally would have been used to generate electricity at OPPD's North Omaha Station.

LMOP 2002 AWARD WINNERS

"We are proud to have been recognized by EPA for our efforts in reducing greenhouse gas emissions. EPA's partnership program is economically and environmentally beneficial for everyone, and we are honored to be a part of it."

—G.W. "Bill" Dietrich, CEO, Onyx North America

INDUSTRY PARTNER OF THE YEAR: ONYX WASTE SERVICES

Milwaukee, Wisconsin

Onyx Waste Services has developed a large portfolio of LFG energy projects, generating 30 MW of power from 5 landfill sites throughout the United States. The company's projects meet the power needs of industrial and residential customers alike. For example, the Onyx Oak Ridge Landfill in Missouri supplies LFG gas as a direct fuel for boilers at DaimlerChrysler's St. Louis assembly plant. Already providing up to 70 percent of the plant's boiler steam load, the project is expected to supply gas for the next 25 years. For the Glacier Ridge Landfill in Wisconsin, Onyx developed a 2 MW landfill gas-to-energy project as part of Alliant Energy's "Second Nature" Renewable Energy Program. This program offers Alliant's customers a choice in supporting clean renewable energy sources. The electricity produced from this facility provides enough power for about 3,000 homes. These and other successful Onyx projects are collectively offsetting the use of more than 2.5 million barrels of oil each year. Onyx plans on doubling the number of projects in the next several years.

STATE PARTNER OF THE YEAR: THE SOUTH CAROLINA ENERGY OFFICE

Columbia, South Carolina

The South Carolina Energy Office (SCEO) has worked diligently with local and state agencies and with industry to launch the first LFG energy projects in the state and build a strong coalition for LFG energy. SCEO has encouraged many influential organizations, such as the State Chamber of Commerce and State Association of Counties, to join in promoting LFG energy as a positive force for the state. SCEO's results-oriented approach helped catalyze many projects, including the Horry County Landfill/Santee Cooper project to generate green power, and a direct-use project to supply energy to a BMW assembly plant using LFG piped 10 miles from a Waste Management, Inc., landfill. Additionally, due to SCEO's efforts, South Carolina recently passed a regulation classifying LFG as a renewable energy source. The combined annual greenhouse gas benefits of the Horry County/Santee Cooper green power program and the BMW/Waste Management direct-use project are the carbon equivalent of removing the emissions from 130,000 cars or planting 180,000 acres of forest.

"BMW wants to do whatever it can to make upstate South Carolina a better place to live. This LFG energy project allows BMW to take a wasted source of energy and use it to generate electricity, which benefits the environment and area residents through lower emissions."

—Dr. Helmut Leube, President, BMW Manufacturing Corporation

“We’re convinced that proactive environmental responsibility is good business. Efforts to reduce our methane emissions often improve the operating efficiency of the pipelines, and that leads to financial reward.”

—Steve Wilner, Columbia Gas and Columbia Gulf Transmission

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 2002, reducing methane emissions from natural gas systems by 5.5 MMTCE in 2002 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 2002, Natural Gas STAR:

- Achieved 58 percent industry participation across all major sectors (production, processing, transmission, and distribution).
- Partnered with four new companies, bringing the total number of partners to 98.
- Expanded the popular technology transfer workshops to include the gas processing sector.
- Initiated a 2-year study to identify additional cost-effective methane emissions reduction opportunities from the gas production and processing sectors.



In 2003, EPA will:

- Expand Natural Gas STAR in all sectors to attain 62 percent industry participation.
- Develop and launch technology transfer workshops for the natural gas distribution and transmission sectors.
- Work with the American Petroleum Institute to implement its voluntary commitment of 100 percent participation in the Natural Gas STAR Program under the President’s “Climate VISION” (Voluntary Innovative Sector Initiatives: Opportunities Now).

NATURAL GAS STAR 2002 AWARD WINNERS

PRODUCTION PARTNER OF THE YEAR PHILLIPS PETROLEUM COMPANY



Phillips Petroleum Company joined the Natural Gas STAR Program in May 1999 and one year later submitted an exemplary implementation plan. The

company has followed up on its commitment by implementing numerous Best Management Practices (BMPs) and Partner Reported Opportunities (PROs), which have produced impressive results. The company reported approximately 235 million cubic feet (MMcf) in methane emissions reductions for 2001, bringing cumulative methane emissions reductions to approximately 1.5 billion cubic feet (Bcf).

TRANSMISSION PARTNER OF THE YEAR DUKE ENERGY GAS TRANSMISSION



Duke Energy Gas Transmission has been a very active

partner since joining the Natural Gas STAR Program in September 2000. The company's first annual report to EPA was impressive, documenting emissions reductions of 4.0 Bcf from 1993 through 2000 and new reductions of 535 MMcf for 2001. Duke Energy is an avid supporter of Natural Gas STAR Program outreach activities. The Manager of Environmental Compliance, David Felcman, presented a paper on Duke Energy's Natural Gas STAR activities at the Canadian Energy Pipeline Association's Climate Change Workshop in Calgary, Alberta, Canada, in September 2002.

DISTRIBUTION PARTNER OF THE YEAR SOUTHWEST GAS CORPORATION



SOUTHWEST GAS CORPORATION

Since joining the Natural Gas STAR Program in 1997, Southwest Gas

Corporation has been an active Gas STAR partner, achieving cumulative methane emissions reductions of 1.7 Bcf. The company's reported reductions for 2001—nearly 445 MMcf—were significantly higher than those reported by any other distribution partner. Southwest Gas has proved its commitment to the Natural Gas STAR Program by enthusiastically promoting the program's benefits. The company recently provided a testimonial at the American Gas Association's annual conference, acknowledging the benefits of participating in Gas STAR, and contributed an article on the Natural Gas STAR Program to the *American Gas Journal*.

PROCESSING PARTNER OF THE YEAR PIONEER NATURAL RESOURCES

PIONEER
NATURAL RESOURCES

Pioneer Natural Resources joined the Natural Gas STAR Program as a charter

processing partner in September 2000. The company's sound implementation of the Natural Gas STAR Program has produced significant emissions reductions in the first full year of participation. Reported reductions in methane emissions for 2001 topped the list for processing partners at 7.3 MMcf, and their reductions total nearly 1.5 Bcf. Pioneer staff shared successes with attendees at the 2002 annual workshop by presenting an overview of their implementation of the Natural Gas STAR Program.

“The EPA Natural Gas STAR Program’s wealth of information about emission reduction tactics eliminated time spent exploring and testing new solutions.”

—Mike Milliet, ChevronTexaco Corporation

CONTINUING EXCELLENCE BP



BP is one of two recipients of the 2001 Continuing Excellence award for its strong presence in the Natural Gas STAR Program. Since joining as a charter production partner (as Amoco) in 1995, BP has continually

exhibited leadership by reducing methane emissions, communicating the benefits of the program, and facilitating technology transfer. BP’s cumulative program reductions have reached nearly 5.6 Bcf, and the 2001 methane emissions reductions were among the highest reported for production partners—508.3 MMcf. BP continues to find and implement new emissions reduction opportunities and actively support Natural Gas STAR Program outreach activities and technology transfer.

CONTINUING EXCELLENCE COLUMBIA GAS TRANSMISSION AND COLUMBIA GULF TRANSMISSION



Columbia Gas and Columbia Gulf Transmission, the Transmission Partners of the Year in 2000 and 2001, were also recipients of the Gas STAR Continuing

Excellence Award in 2002. Columbia Gas and Columbia Gulf have shown outstanding implementation of the Natural Gas STAR Program during their first 3 years of participation. Their nearly 5 Bcf of new reductions reported in 2002 were the highest methane emissions reductions achieved for transmission partners; their cumulative program reductions total more than 18 Bcf. The companies have implemented many PROs since joining the program, and continue to find and implement new emissions reduction opportunities. They are actively working with other companies and business units within NiSource to educate them on the benefits of Gas STAR and the value of methane emissions reductions.

ROOKIE OF THE YEAR MURPHY EXPLORATION AND PRODUCTION



Murphy Exploration and Production joined Natural Gas STAR in November 2000. The company exhibited outstanding

implementation of the Natural Gas STAR Program during its first year of participation, mounting an extensive effort to collect, quantify, and report emissions reductions. The combined implementation plan and annual report for 2001 contained detailed information on the company’s emissions reduction accomplishments to date, totaling an impressive 1.1 Bcf.

ROOKIE OF THE YEAR NORTH CAROLINA NATURAL GAS COMPANY



NCNG
A Progress Energy Company

Since joining as a distribution partner in June 2001, North Carolina Natural Gas Company has exhibited outstanding implementation of the Natural Gas STAR Program. The company’s sound implementation plan, submitted in February 2002, included directed inspection and maintenance (DI&M) at gate and compressor stations and turbine installations. The full rollout of its Gas STAR program began during the second quarter of 2002. Since then, approximately 60 gate stations and all compressor stations have undergone detailed leak inspections.



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 2002.

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 degasification systems. As a result of this collaboration, the percentage of methane recovery grew to more than 80 percent by 2002. To eliminate the remaining methane emitted from degasification systems, CMOP is working with industry to use CMM in power generation and upgrade low-quality gas to pipeline specifications. In addition, the program supports efforts to demonstrate the use of flare technology, which has yet to be employed at an active U.S. mine.

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 92 percent of the remaining methane emissions from underground coal mines—more than 86 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.

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 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 2002 alone achieved a reduction of 1.7 MMTCE.

In 2002, CMOP:

- Reduced methane emissions at 12 of the gassiest mines in the country by providing high-quality, project-specific information to mine operators, project developers, and other stakeholders.
- Completed an analysis of domestic and international emerging markets for ventilation air methane projects, identifying new technologies, and assessing project costs and benefits.
- Began implementing the first commercial-scale demonstration of ventilation air oxidation technology in the United States.



METHANE PROGRAMS

In 2003, EPA will:

- Finalize the first U.S. methane emissions inventory for abandoned coal mines and incorporate it into the *U.S. Inventory of Greenhouse Gas Emissions and Sinks*.
- Work with an industry partner and DOE to begin operating the first commercial-scale demonstration of ventilation air oxidation technology in the United States.
- Work with DOE and the National Mining Association to implement their voluntary commitments to reduce CMM emissions under the President’s “Climate VISION” (Voluntary Innovative Sector Initiatives: Opportunities Now).

TABLE 4.
Methane Programs: annual goals and achievements

	2002 Goal	2002 Achievement	2003 Goal
TOTAL REDUCTIONS (MMTCE)	10.2	11.1	10.6
LMOP			
Number of Projects	235	225	249
Annual Methane Reductions (MMTCE)	3.9	3.9	4.1
Natural Gas STAR			
Industry Participation (% in program)	59%	58%	62%
Annual Gas Savings (MMTCE)	4.6	5.5	4.8
CMOP¹			
Annual Methane Reductions (MMTCE)	1.7	1.7	1.7

¹ Revisions to the methodology for determining emissions from underground coal mines, program achievements, and reduction goals were implemented in 2002. Improved data on pre-drainage wells led to a decrease in emissions estimates and a corresponding downward adjustment of program reduction goals.

PROGRAM EVALUATION: MEASURING RESULTS IN THE METHANE PROGRAMS

Tracking and recording the methane reductions achieved by EPA’s partnership programs is a straightforward process. EPA gathers project-specific data on all the methane reduction activities implemented in coordination with the partnerships.

NATURAL GAS STAR

Industry partners report their reduction activities to EPA on a detailed online reporting form, and EPA works with partners to verify these data.

LANDFILL METHANE OUTREACH

EPA works with all stakeholders to compile up-to-date annual project information. The program reports reductions from only those projects that EPA directly assisted.

COALBED METHANE OUTREACH

EPA gathers state gas sales data for each mine to determine the total amount of coal mine methane used from degasification systems. Although EPA works with every project, the program reports only 40 percent of the total reductions achieved, attributing 60 percent to the impact of the Energy Policy Act of 1992. In the future, the program will also report emissions reductions from ventilation air methane reduction projects.



AGRICULTURE-BASED PROGRAMS

Through outreach to agriculture-based organizations and farmers, 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 U.S. swine and dairy producers to encourage development of waste management systems that produce farm revenues while reducing water and air pollution. EPA provides technical information and tools to aid in the assessment and implementation of these projects.

In 2002, EPA and USDA:

- Coordinated development and implementation of anaerobic digestion funding mechanisms under the 2002 Farm Bill.
- Revised National Standards for Anaerobic Digestion technologies.
- Assisted swine and cattle producers in implementing projects that produced nearly 14 million kWh/year of renewable energy from farms capturing methane—energy then used by the farm and local community.
- Assisted states, including California and New York, in developing programs and policies for the broader deployment of methane-capturing technologies.

In 2003, EPA and USDA will:

- Continue the expansion of methane-reducing technologies in the livestock sector to help ensure clean water and air through implementation of the Farm Bill and extension activities.
- Collaborate with state energy programs in the west, northeast, southeast, and midwest to facilitate the development of anaerobic digesters as renewable energy resources.
- Revise and update the AgSTAR Handbook and FarmWare to provide farmers with the necessary guidance and tools so that they can evaluate and successfully implement proven anaerobic digestion technology.

“Climate friendly processes and products, comprehensive recycling, employee involvement... VAIP and Climate VISION help us put our goals into action.”

—Ken Martchek, Alcoa, Inc.; Chair, Aluminum Association PFC Task Force

HIGH GWP ENVIRONMENTAL STEWARDSHIP PROGRAMS

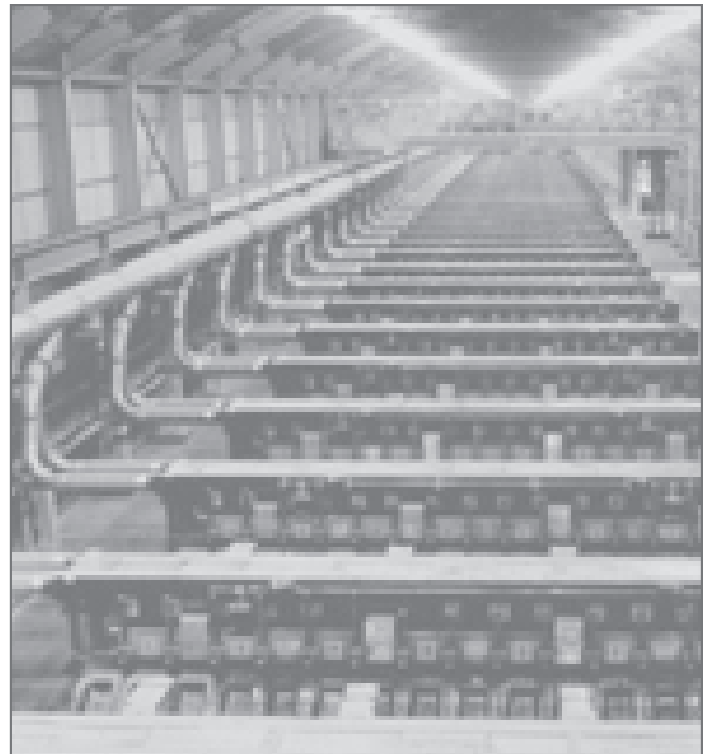
HIGH GLOBAL WARMING POTENTIAL ENVIRONMENTAL STEWARDSHIP PROGRAMS

Public-private industry partnerships are substantially reducing U.S. emissions of the high global warming potential (GWP) gases, which are 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 (SF₆)—all particularly potent greenhouse gases. When compared ton-for-ton with CO₂, they trap much more heat in the atmosphere. PFCs and SF₆ also have very long atmospheric lifetimes (see Table 1). Despite the potential for sizable growth in high GWP greenhouse gas emissions, these partner industries are expected to maintain emissions below 1990 levels through the year 2012 (see Figure 9).

THE VOLUNTARY ALUMINUM INDUSTRIAL PARTNERSHIP (VAIP)

The primary aluminum producers are collaborating with EPA to reduce emissions of PFCs, which are a byproduct of the smelting process. The goal is to reduce perfluoromethane (CF₄) and perfluoroethane (C₂F₆) 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 2002, the Voluntary Aluminum Industrial Partnership supported the International Aluminum Institute's efforts to develop a PFC smelter-specific measurement and training module that will serve as the foundation for an industry-wide, self-supporting measurement program. This module will help smelter managers develop PFC emissions reduction strategies and improve the consistency and comparability of global emissions data.



HIGH GWP ENVIRONMENTAL STEWARDSHIP PROGRAMS

EPA VOLUNTARY PARTNERSHIPS PROVIDE CORNERSTONE FOR THE PRESIDENT'S "CLIMATE VISION" (VOLUNTARY INNOVATIVE SECTOR INITIATIVES: OPPORTUNITIES NOW)

Climate VISION is a voluntary, public-private partnership managed by DOE to pursue cost-effective industry sector initiatives that will reduce the projected growth in America's greenhouse gas emissions. Climate VISION responds to President Bush's announcement on February 14, 2002, to address the long-term challenge of global climate change. As part of this strategy, he committed to reducing America's greenhouse gas intensity—the ratio of emissions to economic output—by 18 percent during the next decade, and he challenged American businesses and industries to undertake broader efforts to help meet that goal. EPA's existing voluntary partnerships in the aluminum, magnesium, and semiconductor sectors will enrich these industries' participation in Climate VISION.

Partner companies in EPA's SF₆ Emission Reduction Partnership for the Magnesium Industry have committed to eliminating SF₆ emissions from their magnesium operations by 2010. SF₆ is the most potent greenhouse gas known today—more than 23,000 times as powerful or potent as the most common greenhouse gas, carbon dioxide. The partner companies committed to eliminating SF₆ emissions represent 100 percent of U.S. primary magnesium production and approximately 80 percent of U.S. magnesium casting and recycling. The industry's actions will reduce overall U.S. SF₆ emissions in 2010 by an estimated 20 percent and will have a climate benefit equivalent to eliminating greenhouse gas emissions from more than one million cars.

The Semiconductor Industry Association (SIA) in partnership with EPA has committed to reducing a suite of the most potent greenhouse gas emissions by 10 percent from 1995 levels by the end of 2010. SIA has agreed to this goal on behalf of 22 semiconductor manufacturers that account for more than 70 percent of this sector's HFC, PFC, and SF₆ "perfluorocompound" emissions. Perfluorocompounds are among the most

potent and persistent of all global warming gases and are used to clean semiconductor manufacturing equipment and to etch silicon wafers to create circuitry patterns. These perfluorocompounds have, on average, 10,000 times the global warming potential of carbon dioxide over 100 years, plus, they can persist in the atmosphere from 2,000 to 50,000 years. Launched in 1996, this partnership has catalyzed global industry efforts by the World Semiconductor Council and other semiconductor trade associations to reduce greenhouse gas emissions worldwide. Semiconductors manage electronic information in a wide variety of products such as computers and cell phones.

The Aluminum Association, representing 98 percent of primary aluminum production in the United States, has agreed to a direct carbon intensity reduction target of 53 percent by 2010 from 1990 levels. The goal includes the reduction in emissions from PFCs and CO₂ from the consumption of the carbon anode. As large industrial energy consumers, the primary producers also agreed to continue their efforts to reduce indirect CO₂ emissions through continued energy efficiency improvements. The industry has been working to reduce greenhouse gas emissions for over a decade, and this new commitment equates to an additional direct carbon intensity reduction of 25 percent since 2000. This commitment builds on the efforts of the Voluntary Aluminum Industry Partnership (VAIP), a partnership program that EPA has had with the industry since 1995. VAIP reduced PFC emissions by more than 45 percent in 2000 compared to the industry's 1990 baseline. The Aluminum Association will measure progress for Climate VISION based on data collected from its members and pledges to support climate protection through efforts to increase aluminum recycling and through the development of lightweight vehicles.

“It might be hard for people not working in semiconductors to imagine how the energy and enthusiasm of technical innovation can inspire environmental protection. Today only a few companies share this ambitious goal, but soon companies will raise their sights to the ultimate goal: ‘climate positive’ and sustainable. Let’s leave the world a little better than when we found it.”

—Dr. Fabio R. Borri, Environment Strategies Corporate Director (retired 2002), STMicroelectronics

HFC-23 EMISSION REDUCTION PROGRAM

Industry is working with EPA to reduce emissions of the potent greenhouse gas, HFC-23, which is generated as 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 technically 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). Despite a considerable increase in production since 1990, total emissions are below 1990 levels—a reduction of 5.1 MMTCE compared to business-as-usual. In 2002, 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.

THE PFC EMISSION REDUCTION PARTNERSHIP FOR THE SEMICONDUCTOR INDUSTRY

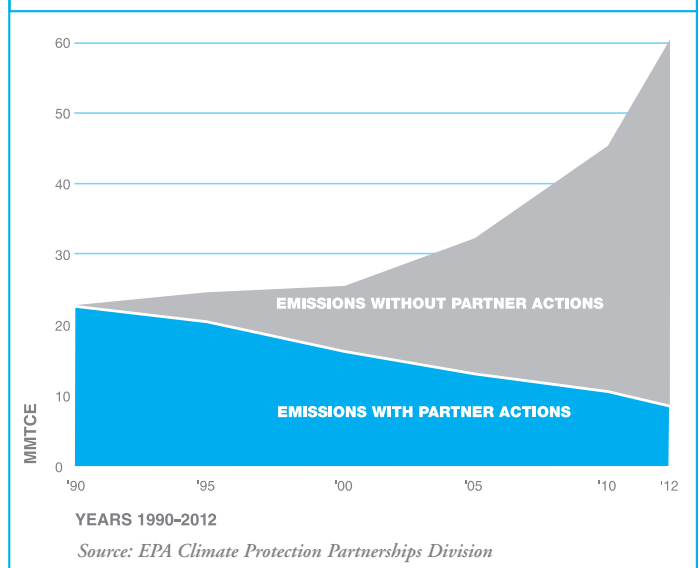


Since 1996, this partnership has been a catalyst for semiconductor companies in Europe, Japan, Korea, Taiwan, and the United States to jointly set the first global target for reducing greenhouse gas emissions.

Collaborating 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 launched the PFC Emission Reduction Partnership for the Semiconductor Industry in 1996. While the partnership’s initial focus was 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 multinational

FIGURE 9. Partner actions can maintain voluntary program sector emissions of high global warming potential gases at or below 1990 levels through 2012



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 2002, the PFC Emission Reduction Partnership for the Semiconductor Industry:

- Analyzed potential PFC emissions from flat panel display (FPD) manufacturing. FPD manufacturing uses PFC-based plasma etch and chamber cleaning processes very similar to those used by the semiconductor industry. EPA encouraged the transfer of cost-effective emissions control technologies from the semiconductor sector to FPD manufacturing at the 6th International Greenhouse Gas Control Technologies Conference in Kyoto, Japan.
- Initiated peer review of its semiconductor emissions projection “vintage” model at the 2002 International Semiconductor Environmental, Safety and Health Conference in San Diego, CA. This model provides EPA and industry with a tool to project PFC emissions based on rapidly evolving semiconductor manufacturing technologies and allows users to understand the impact of emissions reduction strategies as they are expected to be phased into global production. The model also supports EPA’s inventory development and economic analyses.



SF₆ EMISSIONS REDUCTION PARTNERSHIP FOR ELECTRIC POWER SYSTEMS

Initiated in 1999, this partnership provides a forum for the electric power industry to work with the U.S. government to reduce sulfur hexafluoride (SF₆) emissions to technically and economically feasible levels through identifying and encouraging adoption of best technologies and management practices.

SF₆ is used in the transmission of high-voltage electricity. Fugitive emissions from aging high-voltage equipment or improper service and maintenance practices contribute to greenhouse gas emissions. SF₆ Emissions Reduction partners are industry leaders, providing reliable power to customers in an environmentally responsible manner.

In 2002, the SF₆ Emissions Reduction Partnership for Electric Power Systems:

- Developed an electronic report form to facilitate the annual reporting effort.
- Organized the Second International Conference on SF₆ and the Environment in San Diego, CA. Co-sponsored by the Australian Greenhouse Office, Environment Canada, and The Netherlands Reduction Program for Non-CO₂ Greenhouse Gases (ROV), the conference attracted more than 100 attendees from 10 countries.



SF₆ 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 (SF₆), 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 U.S. magnesium industry emissions.

*“Magnesium is the climate friendly material for the 21st century. EPA has proven itself a valuable partner to the U.S. magnesium industry and the International Magnesium Association as we work together to **eliminate** direct emissions of SF₆—an extremely potent greenhouse gas. Furthermore, our industry’s light weight magnesium automotive parts will enable the design and production of the cleaner, more fuel-efficient vehicles required for a sustainable future.”*

—Helmut Brandt, President, Lunt Manufacturing; President, International Magnesium Association

In 2002, the SF₆ Emission Reduction Partnership for the Magnesium Industry:

- Signed its first Memorandum of Understanding (MOU) with a magnesium recycling firm and now partners with 16 companies, representing 100 percent of primary magnesium production and 80 percent of domestic casting and recycling capacity.
- Completed its third annual emissions reports from magnesium partners. Emissions estimates are reported using software designed by EPA with input from the partners. EPA’s partners have reduced total SF₆ emissions by 40 percent in 3 years.
- Concluded a 3-year cooperative study with the International Magnesium Association to identify viable alternative cover gases. This successful investigation identified promising alternatives such as HFC-134a, Novec 612 (a 3M fluorinated ketone), and hydrofluoroethers.
- Conducted the first measurement campaign to characterize emissions from hot-chambered magnesium die-casting processes, presenting the results at the Metals, Minerals, and Materials Society’s (TMS) annual meeting. EPA wishes to thank its partner, Product Technologies, for participating in this groundbreaking study.

MOBILE AIR CONDITIONING CLIMATE PROTECTION PARTNERSHIP

Under the Montreal Protocol for the Protection of the Ozone Layer, new vehicles worldwide have been redesigned to use HFC-134a refrigerants in air-conditioning systems rather than CFC-12. The production of CFC-12 refrigerants for use in developed countries was halted in 1996 and will be phased out globally by 2006. HFC-134a was the global choice because it has no ozone depleting potential, has six times less global warming potential than CFC-12, is non-flammable, has low toxicity, and has cooling capacity and energy efficiency that can be made comparable to CFC-12 through engineering. Although HFC-134a has far less impact on the climate than the CFC-12 it replaced, it is part of “the basket” of greenhouse gases whose emissions need to be reduced.

The Society of Automotive Engineers (SAE), the Mobile Air Conditioning Society Worldwide, and EPA have organized a global voluntary partnership to promote improved

air-conditioning systems and service. This partnership includes environmental authorities from Australia, Canada, Europe, and Japan; environmental and industry non-government organizations (NGOs); and global vehicle manufacturers and their suppliers. Measures to improve the environmental performance of vehicle air conditioning systems consider (1) both refrigerant and fuel consumption over the life of the vehicle, (2) consumer demand for reliable and affordable transportation, and (3) requirements for special safety systems and technician training.

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.

In 2002, the partnership completed laboratory testing of air-conditioning systems using carbon dioxide, HFC-152a, and hydrocarbons, comparing environmental performance against the benchmarked HFC-134a system. Partners held meetings in Europe and North America, and organized the “2003 MAC Summit” in Brussels, Belgium, to provide the latest technical information to policymakers.

Participants at the MAC Summit concluded that the current HFC-134a systems could be enhanced to reduce refrigerant greenhouse gas emissions by up to 50 percent and reduce fuel use for air-conditioning by up to 30 percent at an added cost that would be quickly recovered in fuel savings, reduced maintenance, and increased reliability. The partnership is now developing a new strategy to promote these environmental and product improvements.

The partnership has also instituted the “Automotive Alternate Refrigerant Symposium” as an annual event to showcase technical presentations and road tests of prototype motor vehicles using the new alternative refrigerants HC, HFC-152a, and CO₂.

HIGH GWP ENVIRONMENTAL STEWARDSHIP PROGRAMS



In 2003, the High GWP Environmental Stewardship Programs will:

- Conduct smelter measurements at three partner facilities to complete the U.S. smelter-type data set and to validate past process-type measurements. Develop training materials to support aluminum process engineer and cell operator efforts to reduce PFC emissions.
- Work with the U.S. semiconductor partners to achieve their 10 percent PFC emissions reduction goal by 2010 from their 1995 baseline, support reporting of high quality emissions data through the development of a data collection tool kit for partner companies, seek to quantify greenhouse gas emissions from FPD manufacturing, and facilitate the transfer of appropriate emissions reduction technologies from the semiconductor sector.
- Support the SF₆ Emissions Reduction Partnership for Electric Power Systems (utilities) through the analysis of new equipment leak rates.
- 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.
- Continue to explore and document the performance of new vehicle air-conditioning designs.
- Collaborate with the Australian Greenhouse Office to implement information sharing projects to reduce high GWP emissions.

TABLE 5.
Stewardship Programs: annual goals and achievements

	2002 Goal	2002 Achievement	2003 Goal
TOTAL REDUCTIONS (MMTCE)	7.2	7.4	8.6
VOLUNTARY ALUMINUM INDUSTRIAL PARTNERSHIP			
Industry Participation (% in program)	95%	98%	98%
Reductions (MMTCE)	2.0	1.8	2.1
HFC-23 PARTNERSHIP			
Industry Participation ¹ (% in program)	100%	100%	100%
Reductions (MMTCE)	4.4	4.5	4.9
OTHER STEWARDSHIP PROGRAMS			
Industry Participation (% in program) ²	60%–100%	45%–100%	50%–100%
Reductions (MMTCE)	0.8	1.1	1.6

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.



INTERNATIONAL CLIMATE PROTECTION AWARD WINNERS

Since 1998, 81 individuals, companies, and organizations from 14 countries have earned EPA's Climate Protection Award honoring outstanding accomplishments in protecting the Earth's climate. The award recipients have demonstrated their commitment to the environment through innovation in engineering, policy, and marketing. Their leadership will reduce greenhouse gas emissions and inspire others to do their part. This year's winners are from China, India, South Korea, and the United States.

CORPORATE AND GOVERNMENT AWARDS

Center for Power Efficiency and Environmental Protection (CenPEEP)
India

Chicago Department of Environment
Illinois

China National Institute of Standardization (CNIS)
China

City of Chula Vista
California

Emerald Homes
Texas

Pacific Gas and Electric Company (PG&E)
California

City of Seattle
Washington

ORGANIZATION AND ASSOCIATION AWARDS

Green House Network

International Council for Local Environmental Initiatives (ICLEI)

The Society of Automotive Engineers (SAE) Interior Climate Control
Standards Committee

INDIVIDUAL AWARDS

Mayor Ross C. "Rocky" Anderson
Salt Lake City, Utah

Dr. Seunghun Joh
Korea Environment Institute, South Korea

David Konkle
Ann Arbor Energy Office, Michigan

2003 LIFETIME ATMOSPHERIC ACHIEVEMENT AWARD

SC Johnson & Son, Inc., USA

BENEFITS OF VOLUNTARY PROGRAMS



BENEFITS OF VOLUNTARY PROGRAMS

ENERGY STAR and other voluntary programs have been very successful during their first decade. They have dramatically increased the use of energy-efficient products and practices and reduced emissions of carbon dioxide, as well as methane and other greenhouse gases with very high global warming potentials.

For the year 2002, these partnerships prevented 43 million metric tons of greenhouse gas emissions (in MMTCE)—equivalent to the annual emissions from more than 28 million vehicles—while helping Americans save more than \$7 billion.

And the benefits from these programs extend well beyond the emissions reductions and dollar savings in the year 2002 alone. As the partnership programs spur investment in climate friendly technologies and the purchase of energy-efficient products, they create a stream of benefits that accrue over the lifetime of the investment or product. Overall, the benefits from the investments and product purchases of program partners and consumers through the year 2002 can be summarized as follows:

- More than 600 million metric tons of greenhouse gas emissions are being avoided through 2012.
- Consumers and businesses have locked in investments in energy-efficient technologies exceeding \$12 billion.
- Net of the investments in energy-efficient technologies, consumers and businesses are saving more than \$80 billion cumulatively through 2012.⁶

The benefits (see Table ES-1 on page 3) and how they are derived are described below for three key climate partnership program areas: ENERGY STAR, Methane Programs, and Environmental Stewardship Programs for the High GWP Gases.

ENERGY STAR. The estimated benefits from the ENERGY STAR program reflect the stream of energy savings that will persist through 2012 due to technology investments and product purchases made through the year 2002 by ENERGY STAR partners and due to the effects of markets already transformed. The persistence is calculated by maintaining the energy savings achieved in 2002 through the year 2012.⁷ The underlying assumption is that the lifetime of most building improvements and product purchases is at least 10 years. For products with shorter lifetimes, such as computers, fax machines, and audio equipment, it 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 2002 annual report. From these expected energy savings, benefits are determined in the following manner:

- Emissions prevented are calculated as the product of the energy savings (e.g., kWh of electricity) and an annual emission factor (e.g., MMTCE prevented per kWh).

⁶ Net economic benefits are calculated by estimating the savings in energy expenditures by partners and customers of ENERGY STAR qualified products and subtracting any additional capital expenditures necessary to purchase qualified products, upgrade to ENERGY STAR specifications, or change from general operating procedures.

⁷ The energy savings for the year 2002 are estimated from information provided by the Division for the ENERGY STAR Building and Industrial Improvements program and by information provided by the Lawrence Berkley National Laboratory for ENERGY STAR Qualified Products.

THROUGH THE EFFORTS OF EPA AND ITS PARTNERS, WE WILL MAINTAIN METHANE EMISSIONS BELOW 1990 LEVELS THROUGH 2012.

- The energy bill savings are determined as the product of the energy saved and the cost of electricity for the affected market segment, residential or commercial.⁸
- The net present value (NPV) of these savings are calculated using a 4-percent discount rate and a 2002 perspective.⁹

In addition, EPA estimates the 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 2012 are as follows:

Qualified Products

- Preventing 144 MMTCE in greenhouse gas emissions.
- Catalyzing \$1.6 billion in investment in climate friendly technologies.
- Providing energy bill savings net of investment of \$48.8 billion.

Building and Industrial Improvements

- Preventing 178 MMTCE in greenhouse gas emissions.
- Catalyzing \$8 billion in investment in climate friendly technologies.
- Providing energy bill savings net of investment of \$32.5 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 2012:

- Preventing 163 MMTCE in greenhouse gas emissions.
- Catalyzing \$2.7 billion in investment in climate friendly technologies.
- Providing energy bill savings net of investment of \$2.9 billion.

ENVIRONMENTAL STEWARDSHIP PROGRAMS FOR THE HIGH GWP GASES.

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 2012. Expenditures and financial savings in the Environmental Stewardship 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 2012:

- Preventing 117 MMTCE in greenhouse gas emissions.

⁸The estimates for the retail cost of electricity are taken from the Energy Information Administration's (EIA's) Annual Energy Review for historic prices and from EIA's Annual Energy Outlook 2003 for prospective prices.

⁹The 4-percent discount rate used was taken from the Office of Management and Budget Circular 94.

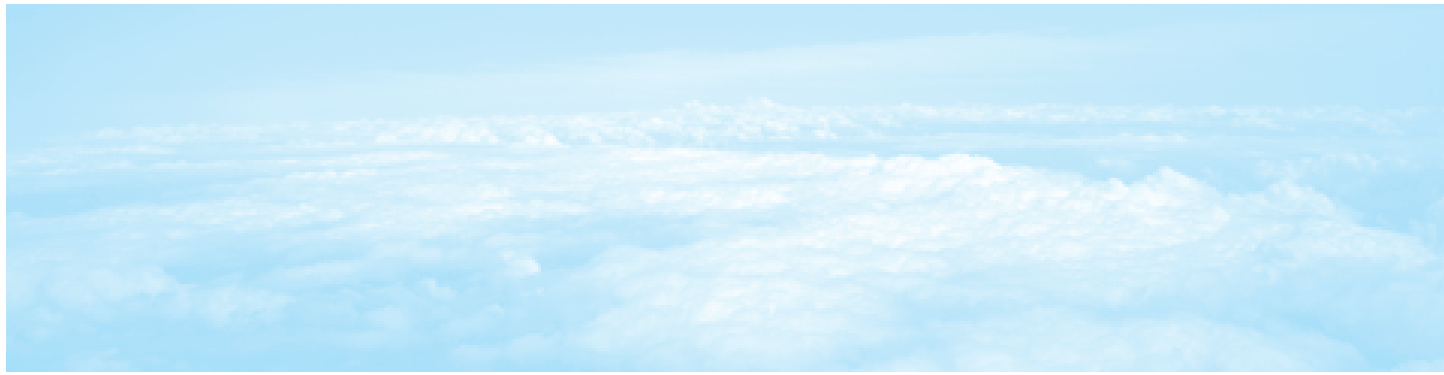
¹⁰The NPV of these expenditures was calculated using a 4-percent real discount rate and a 2002 perspective.

REFERENCES

- Climate Protection Partnerships Division, U.S. Environmental Protection Agency. Partner and emissions data for 2002 provided by individual programs and partnerships in the Division.
- Dutrow, Elizabeth. 2003. *An Estimate of Emissions Reductions Accomplished by ENERGY STAR Industrial Partners*. EPA Climate Protection Partnerships Division.
- Energy Information Administration (EIA). 2002. *Annual Energy Review 2001*. Office of Markets and End Use. Available online at www.eia.doe.gov/aer/contents.html.
- EIA. 2003. *Annual Energy Outlook 2003 with Projections to 2025*. Office of Integrated Analysis and Forecasting. January. (DOE/EIA-0383(2003)).
- Horowitz, M.J. 2001. "Economic Indicators of Market Transformation: Energy Efficient Lighting and EPA's Green Lights." *The Energy Journal* 2(4):95-122.
- Innovest Strategic Value Advisors. 2002. *Energy Management and Investor Returns: The Real Estate Sector*. October.
- 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). Available online at <http://enduse.lbl.gov/Info/Pubs.html>.
- New Buildings Institute. 2003. Annual Report 2002. Available online at www.newbuildings.org/about.htm.
- U.S. Department of State. 2002. *U.S. Climate Action Report 2002*. Washington, D.C. May. Available online at www.epa.gov/globalwarming/publications/cat/index.html.
- U.S. Environmental Protection Agency (EPA). 2002. Administrator Whitman to Commend the Real Estate Investment Industry for its Commitment to the Environment. Headquarters Press Release. December 12. Available online at www.epa.gov/newsroom.
- EPA. 2003. *Inventory of Greenhouse Gas Emissions and Sinks: 1990-2001*. Office of Atmospheric Programs. April. (EPA 430-R-03-004). Available online at www.epa.gov/globalwarming/publications/emissions/us2003/index.htm.
- Webber, C.A., R.E. Brown, M. McWhinney, and J.G. Koomey. 2003. *2002 Status Report: Savings Estimates for the ENERGY STAR® Voluntary Labeling Program (DRAFT)*. Lawrence Berkeley National Laboratory. March. (LBNL-51319).

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