ENERGY STAR

ENERGY STAR® and Other Climate Protection Partnerships

2006 Annual Report

EPA

United States
Environmental Protection
Agency

ENERGY STAR® AND OTHER CLIMATE PROTECTION PARTNERSHIPS
2006 ANNUAL REPORT

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For additional information, please visit our Web sites at www.epa.gov/cppd, www.energystar.gov, www.epa.gov/cleanenergy/stateandlocal/index.htm, www.epa.gov/methane, and www.epa.gov/highgwp.

NOTE: The data source for all figures and tables in this 2006 Annual Report is EPA's Climate Protection Partnership Programs unless otherwise noted. Historical totals have been updated based on the most recent available data.

September 2007

I am pleased to present this report on the accomplishments of EPA's climate protection programs. For 15 years, EPA has joined forces with thousands of organizations across the country to reduce greenhouse gas emissions through greater use of energy efficiency and clean energy. Together, we are making significant progress—EPA's programs are expected to contribute about 70 percent of the emissions reductions needed to meet the President's aggressive greenhouse gas intensity goal.

Energy efficiency is one of the nation's great energy resources, and ENERGY STAR is helping bring energy efficiency to homes, schools, businesses, and communities across the country—with impressive results. In 2006 alone, Americans, with the help of ENERGY STAR, saved about $14 billion on their utility bills while preventing greenhouse gas emissions equivalent to those from 25 million vehicles.

EPA is also working to spur investment in clean energy supplies. On the fifth anniversary of our Green Power Partnership and the Combined Heat and Power Partnership, we have worked with more than 650 organizations buying almost 7 billion kilowatt-hours of green power and another 200 that have installed more than 3,500 MW of new combined heat and power capacity.

EPA's partners are also continuing their remarkable efforts to curb emissions of methane and other potent greenhouse gases. In 2006, EPA's partners avoided the emissions equivalent to those from more than 15 million vehicles. Their commitment continues to keep emissions of these gases at more than 10 percent below 1990 levels and proves that proactive climate protection efforts can be part of successful business strategies.

Corporations are also realizing the multiple benefits of energy efficiency, clean energy, and other strategies to reduce greenhouse gas emissions, as evidenced by the continued growth of the Climate Leaders program. The partnership has grown to 107 partners, representing more than 8 percent of total U.S. greenhouse gas emissions, and 8 partners have already reached the aggressive targets they set earlier through the program.

The success of ENERGY STAR and EPA's other voluntary programs demonstrates that individuals and businesses can do well by doing good. EPA appreciates its partners' inspiring efforts to address climate change through its voluntary programs and looks forward to continuing these collaborations far into the future.

Sincerely,

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

EXECUTIVE SUMMARY

In 2006, the U.S. Environmental Protection Agency's (EPA's) climate protection partnership programs significantly reduced the emissions of greenhouse gases that contribute to global climate change. This suite of well-designed programs lowers energy costs, helps hedge against the volatility of energy markets, and improves national energy security by addressing identified market barriers and accelerating the adoption of proven, cost-effective technologies and practices.

Through these partnerships, more than 11,000 organizations nationwide invested in energy efficiency, clean energy supply, and other climate-friendly technologies and made significant progress toward the President's aggressive greenhouse gas intensity reduction goal for 2012[1] (see Table 1 and Figure 1).

The measures adopted by EPA's partners through 2006 have resulted in the following major environmental and economic benefits:

- The prevention of 70 million metric tons (in MMTCE[2]) of greenhouse gases, equivalent to the emissions from 45 million vehicles, and net savings to consumers and businesses of more than $14 billion in 2006 alone.
- Prevention of more than 980 MMTCE and net savings to consumers and businesses of about $160 billion over the lifetime of their investments.
- Investment of more than $50 billion in energy-efficient and climate-friendly technologies.

Highlights of 2006

- Climate Leaders, the Administration's corporate leadership program, engages Fortune 500 and other leading companies and organizations in aggressively reducing their greenhouse gas emissions. In 2006, the program exceeded its milestone of 100 partner companies. More than half of these companies announced aggressive greenhouse gases reduction targets for the future—which represent a reduction in greenhouse gas emissions of more than 10 million metric tons over business-as-usual outcomes—and eight have announced achievement of previously set goals.
- Energy efficiency offers one of the lowest cost solutions for improving our energy security, reducing our energy bills, and addressing the important issue of global climate change—all while helping to grow the economy. Since its inception in 1992, the ENERGY STAR program has helped individuals and organizations nationwide find cost-effective, energy-efficient solutions. As of 2006, ENERGY STAR has helped prevent the greenhouse gas emissions equivalent to those from 25 million vehicles while saving Americans about $14 billion on their energy bills across the nation's homes, schools, office buildings, industries, and other facilities (see Figure 2).
- The Clean Energy Supply programs celebrated their 5th anniversary of working to improve the supply of the nation's clean energy resources. Their substantial progress includes partners purchasing almost 7 billion kilowatt-hours (kWh) of green power annually and installing more than 3,500 megawatts (MW) of new combined heat and power capacity.
- EPA expanded its efforts to assist state and local governments in their pursuit of clean energy policies by growing its state partnership to include 14 states and launching a Clean Energy-Environment Municipal Network.
- The EPA- and U.S. Department of Energy (DOE)-facilitated National Action Plan on Energy Efficiency (Action Plan) released five key recommendations for aligning policies at the state level to encourage investment in all cost-effective energy efficiency measures. Eighty-nine organizations across 46 states publicly supported the recommendations and/or announced actions they would take to implement them.
- The methane (CH_4) programs continued to reduce emissions of this potent greenhouse gas. They exceeded their emissions reductions goals in 2006 and kept national methane emissions to well below 1990 levels.
- The partnerships focusing on high global warming potential (GWP) gases kept national emissions of these gases from industrial sources to well below 1990 levels. Further, EPA has made important progress in the effort to reduce emissions from the use and maintenance of auto air conditioners.

[1] Greenhouse gas intensity is the ratio of greenhouse gas emissions to economic output (measured by the gross domestic product). EPA's climate programs are expected to contribute 77 million metric tons of carbon equivalent (MMTCE), or about 70%, of the emissions reductions needed to achieve the President's goal of an 18% reduction in greenhouse gas intensity by 2012. For more information on the Administration's goal, see http://www.whitehouse.gov/news/releases/2002/02/climatechange.html.

[2] Million metric tons of carbon equivalent (MMTCE). Reductions in greenhouse gas emissions for EPA's climate programs 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.

TABLE 1. ANNUAL AND CUMULATIVE BENEFITS FROM PARTNER ACTIONS THROUGH 2006 (IN BILLIONS OF 2006 DOLLARS AND MMTCE)

	BENEFITS FOR 2006		CUMULATIVE BENEFITS 1993 - 2016			
Program	Net Savings (Billion $)	Emissions Avoided (MMTCE)	PV of Bill Savings (Billion $)	PV of Technology Expenditures (Billion $)	PV of Net Savings (Billion $)	Emissions Avoided (MMTCE)
ENERGY STAR Total	**$13.7**	**37.6**	**$202.4**	**$48.1**	**$154.3**	**491**
Qualified Products and Homes	$6.8	16.0	$95.8	$14.6	$81.2	204
Buildings	$4.9	15.2	$83.7	$28.7	$55.0	197
Industry	$2.0	6.5	$22.9	$4.9	$18.0	90
Clean Energy Supply Programs	—	3.7	—	na	—	47
Methane Programs	$0.4	16.1	$8.1	$3.6	$4.5	224
High GWP Gas Programs	—	13.3	—	na	—	223
TOTAL	**$14.2**	**70.7**	**$210.5**	**$51.8**	**$159**	**986**

PV: 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. Totals may not equal sum of components due to independent rounding. For details on cumulative benefits, see pages 40, 41, 44, and 55.

____ : Not applicable

na: Not available

FIGURE 1. GREENHOUSE GAS EMISSIONS REDUCTIONS EXCEED 70 MMTCE—EQUIVALENT TO 45 MILLION VEHICLES

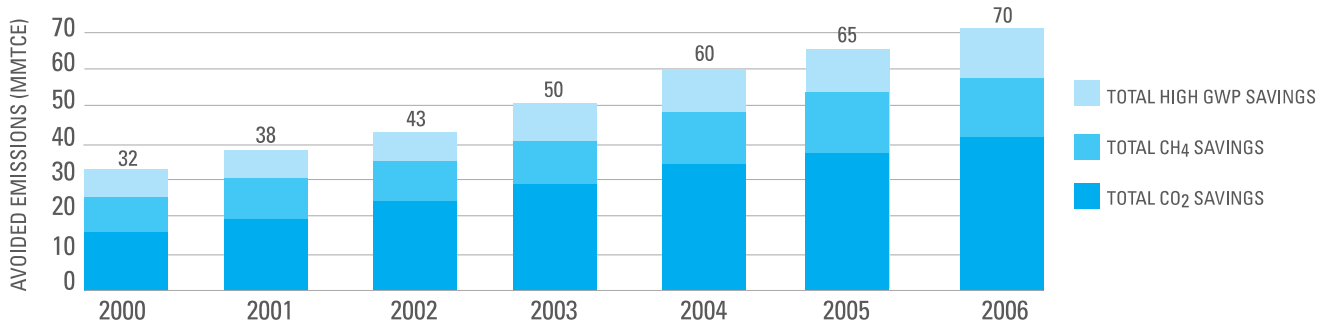
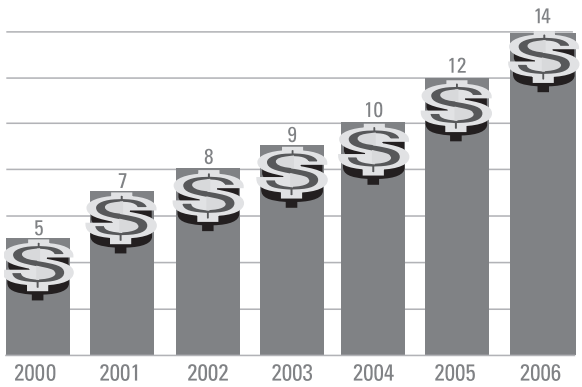
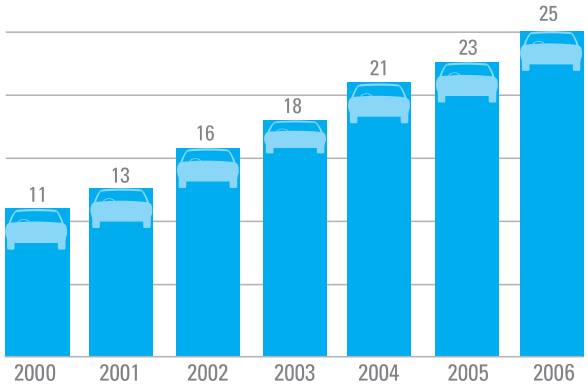


FIGURE 2. ENERGY STAR BENEFITS CONTINUE TO GROW



UTILITY BILL SAVINGS
(in billions)



EMISSIONS SAVED IN
VEHICLE EQUIVALENTS (in millions)

Looking Closer and Looking Forward

More detail on the 2006 accomplishments of EPA's climate protection partnerships is provided in this section. EPA continually refines and expands the climate protection programs to increase the environmental benefits. These programs are on track to achieve aggressive longer term goals with current estimates showing that their benefits will nearly double in 10 years from 2006 levels (see Table 2 and Figure 4, p. 7). Some of the steps EPA will take to reach those goals are also outlined below.

Climate Leaders. In less than 5 years, Climate Leaders has grown to 107 partners, with a more than 25 percent increase in the past year. Further, partners are on track to announce aggressive greenhouse gas reduction goals and subsequently achieve those goals. EPA will engage more organizations in understanding their carbon risks and reducing their carbon footprint by helping them accurately inventory their greenhouse gas emissions, set aggressive reduction goals, and report on progress. EPA has developed and tested protocols to ensure high-quality corporate inventories. EPA has also released draft accounting guidance on green power purchases and emissions offset projects.

ENERGY STAR. A growing body of literature demonstrates that efforts like ENERGY STAR are critical to addressing climate change (see Figure 3). The greenhouse gas and energy bill savings from the ENERGY STAR program in 2006 are 10 percent greater than those of the prior year and more than double the savings in 2000. These savings are largely the result of reduced demand for electricity that totaled an impressive 170 billion kWh—almost 5% of total U.S. electricity demand—and 35 gigawatts (GW) of peak power, equivalent to the capacity of 70 power plants in 2006. EPA will continue to build the ENERGY STAR program as a credible guide for investment in energy efficiency for consumers, businesses, and other organizations to leverage as part of their efficiency efforts. EPA is maintaining the integrity of and continuing to build the value of the ENERGY STAR program. Key ENERGY STAR highlights include:

- More than 1,700 manufacturers are using the ENERGY STAR label on a total of over 40,000 individual product models across more than 50 product categories. American consumers are purchasing about 300 million ENERGY STAR products annually, a total of more than 2 billion ENERGY STAR qualified products since 1992.
- EPA expanded the ENERGY STAR program in 2006 to include efficient battery chargers to improve the efficiency of the growing number of small household and commercial products and also updated the ENERGY STAR requirements for several widely used products, such as computers and imaging equipment.
- EPA will continue to expand the ENERGY STAR label to new product categories where the core program principles of cost-effectiveness and maintenance of product performance can be met, and will revise the requirements for products already in the program as conditions warrant. EPA will also continue to work with its vast partnership network to help consumers and businesses, both large and small, choose ENERGY STAR qualified products with an emphasis on lighting products, small household appliances, commercial food service, office equipment, and heating and cooling products. Overall, EPA expects more than 300 million ENERGY STAR qualified products to be sold each year for the foreseeable future.
- A significant number of new homes—about 12 percent nationwide—were built to ENERGY STAR guidelines. The number totaled almost 725,000 homes through 2006, constructed by about 3,500 builders in every state across the country. EPA will continue to partner with home builders and other organizations in the industry to construct more than 100,000 new ENERGY STAR homes each year and bring ENERGY STAR qualified homes to more markets throughout the country.
- Home Performance with ENERGY STAR, a whole-house retrofit program that provides guidance for going beyond the straightforward purchase of efficient products, made great progress. Across the country, 28,000 homes have been improved through the 18 locally sponsored programs, three of which launched in 2006. EPA will be working to bring this program and its significant financial savings to about five new communities each year. Additionally, EPA will develop and launch a new service for quality installation of heating and cooling equipment, taking it to three to five new communities each year.
- EPA continues to expand its efforts across the commercial buildings sector through its ENERGY STAR Challenge and other efforts. Thousands of public and private organizations are using ENERGY STAR tools and resources to improve the efficiency of their buildings; more than 30,000 buildings have been rated for energy performance. In addition, more than 3,200 buildings across the nation have earned the

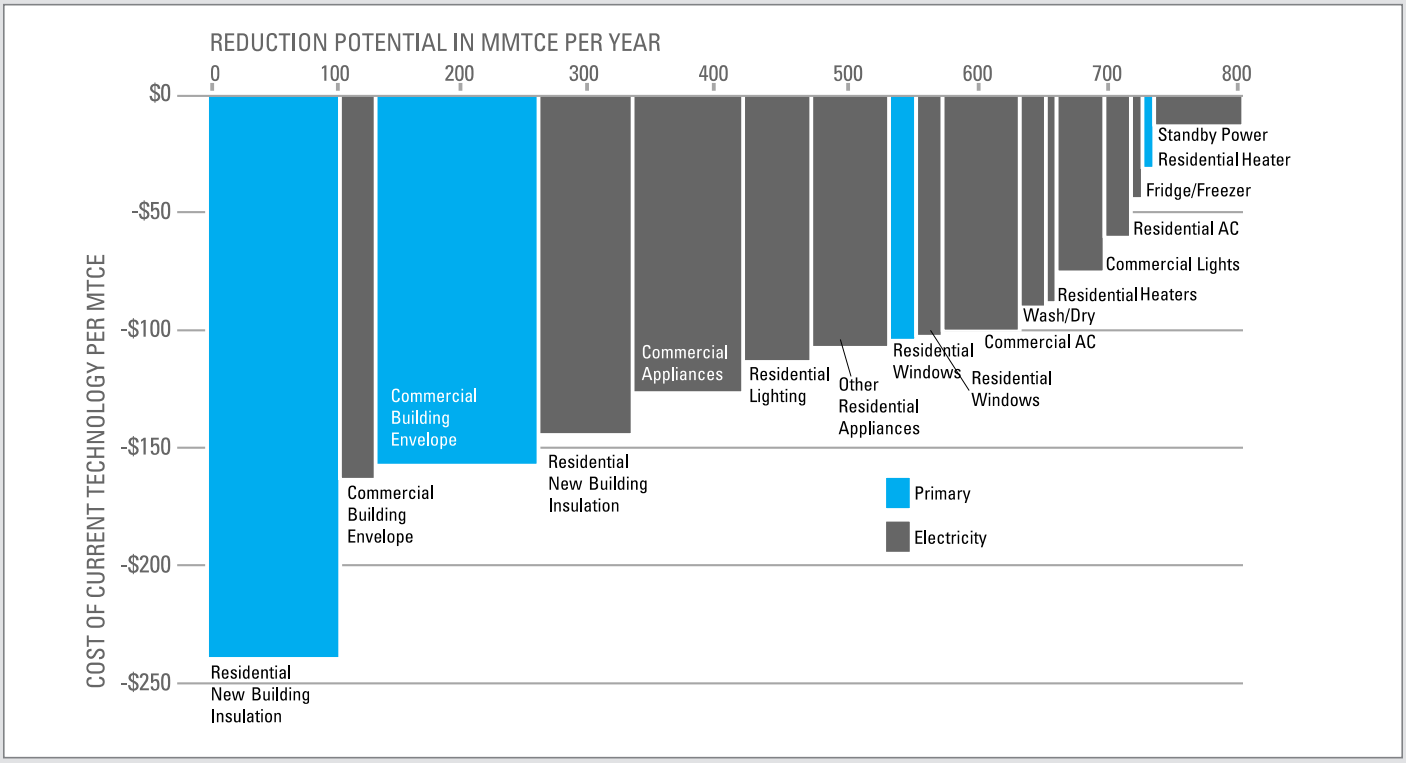
FIGURE 3. IMPROVING ENERGY EFFICIENCY IN THE BUILDING SECTOR IS CRITICAL TO ADDRESSING CLIMATE CHANGE

As the effects of climate change begin to manifest themselves in the United States and abroad, the demand for near-term solutions across all sectors of the economy is skyrocketing. The European consulting firm Vattenfall recently published the Climate Map 2030,[3] the first attempt to outline global possibilities for greenhouse gas reductions over the next 20 years. The report demonstrates how programs such as ENERGY STAR are critical to successfully addressing climate change.

Buildings are currently responsible for more than 8% of global greenhouse gas emissions, of which the United States, European Union, and Canada account for more than 60%. Of all the sectors reviewed in the report, the building sector is the only one in which all of the reduction potential is achievable through current technologies at negative or no-cost (see figure below). The report cites "market failures" such as misaligned incentives, end-user behavior, and program costs as the reasons why these technologies are not currently being adopted. These are exactly the market barriers to cost-effective energy efficiency investments that the ENERGY STAR program has been dismantling since 1992. The potential is enormous; about 3% of the total global reduction potential is in investments in currently available cost-effective, energy-efficient products and practices in North America's buildings alone—the buildings within reach of the ENERGY STAR program.

The report also calls attention to other areas in which EPA climate protection programs are delivering cost-effective, near-term climate change solutions. Reduced energy demand in the power sector, energy efficiency in the industrial sector, clean energy supply, and agricultural and landfill methane capture are all singled out as having large reduction potentials in the United States and abroad.

The Vattenfall Climate Map 2030 is just one piece of a growing body of literature that concludes that ENERGY STAR and EPA's other climate protection programs are delivering vital solutions to climate change—today.



EPA PROGRAMS ARE HIGHLY COST-EFFECTIVE MECHANISMS FOR REDUCING GREENHOUSE GAS EMISSIONS

EPA's climate programs are a very cost-effective approach for reducing U.S. greenhouse gas emissions. Moreover, it is clear from sources such as the Vattenfall Climate Map that there are still great untapped opportunities for these programs to capture—meaning they will continue to be cost-effective far into the future. Every federal dollar spent on these partnership programs through 2006 means:

- Reductions in greenhouse gas emissions of 1.0 metric ton of carbon equivalent.
- Savings for partners and consumers of more than $75 on their energy bills.
- Private sector investment of more than $15.
- A net savings of more than $60.

[3] All data from Vattenfall, AB, 2007. For a copy of the full report, see the company Web site in References, p. 71.

ENERGY STAR label for superior energy performance and use 35 percent less energy than average buildings. EPA will continue to partner with states, trade associations, and others to engage, train, and otherwise facilitate these building improvements. Strategies include advancing effective energy management as a core business strategy and promoting standardized measurement systems for assessing the efficiency of these facilities, targeting improvements, and tracking progress.

- EPA expanded its industrial focus program to include 10 industrial sectors and developed plant-level benchmarking and other tools. For the first time, EPA awarded the ENERGY STAR label to industrial facilities. Twenty plants across the country now display the ENERGY STAR. EPA expects to expand its industrial work to more industrial partners and two additional industrial focus sectors each year.
- EPA updated its ENERGY STAR agreement with the European Union and developed an agreement with China on harmonization of endorsement labeling.

Clean Energy Supply. EPA's clean energy supply programs prevented 3.7 MMTCE in their fifth year. The Green Power Partnership grew to more than 650 partners who purchased close to 7 billion kilowatt-hours (kWh) of green power. The Combined Heat and Power (CHP) Partnership supported 200 partners nationwide and helped facilitate CHP projects totaling more than 3,500 MW of new CHP capacity. These projects are up to 35 percent more efficient than traditional, separate heat and power generation. EPA will assist CHP partners in identifying and developing new projects and will encourage new and existing Green Power partners to purchase green power.

State and Local Government Clean Energy Programs. EPA continued to assist state and local officials in their quest to develop and implement clean energy strategies by:

- Expanding its Clean Energy-Environment State Partnership —a clean energy technical assistance program—to include 14 states and launching the Clean Energy-Environment Municipal Network to provide new tools and resources for local governments. In support of these efforts, EPA published a new clean energy policy guidance document, the *Guide to Action*, that assists in the assessment and implementation of more than 16 state-level clean energy policies. In 2007, EPA plans to add one new partner to the State Partnership, share best policy practices, and expand the Municipal Network.
- Ensuring the Action Plan reached important milestones in its first year as it strives to curb more than 50 percent of the expected growth in U.S. energy demand and capture $20 billion in potential energy savings. In 2007, EPA will continue to facilitate the Action Plan in conjunction with DOE, focusing on the development of resources vital to implementing the recommendations and launching a new Sector Collaborative on Energy Efficiency.

Methane and High Global Warming Potential (GWP) Gas Programs. National methane emissions and high GWP gas emissions are currently below 1990 baselines[4] and expected to stay that way into the future due to EPA's partnership programs such as the Landfill Methane Outreach Program, the Natural Gas STAR Program, and a suite of programs addressing the high GWP gases. The reduction of non-carbon dioxide (CO_2) gases totaled nearly 30 MMTCE in 2006 or the emissions equivalent to those from more than 15 million vehicles. In addition, the Methane to Markets Partnership spread the success of EPA's domestic methane partnership programs overseas. EPA will continue its progress with these programs by:

- Working aggressively with existing and new partner companies to develop more methane emissions reduction projects and maintain overall methane emissions below 1990 levels.
- Partnering with companies in the aluminum, magnesium, semiconductor, utility, HCFC-22, and mobile air conditioning sectors to reduce emissions of high GWP gases.

International Climate Protection Awards. EPA, working with an international team of reviewers, recognized 17 visionary organizations and individuals from six different countries around the world for their leadership in addressing global climate change issues (see p. 7).

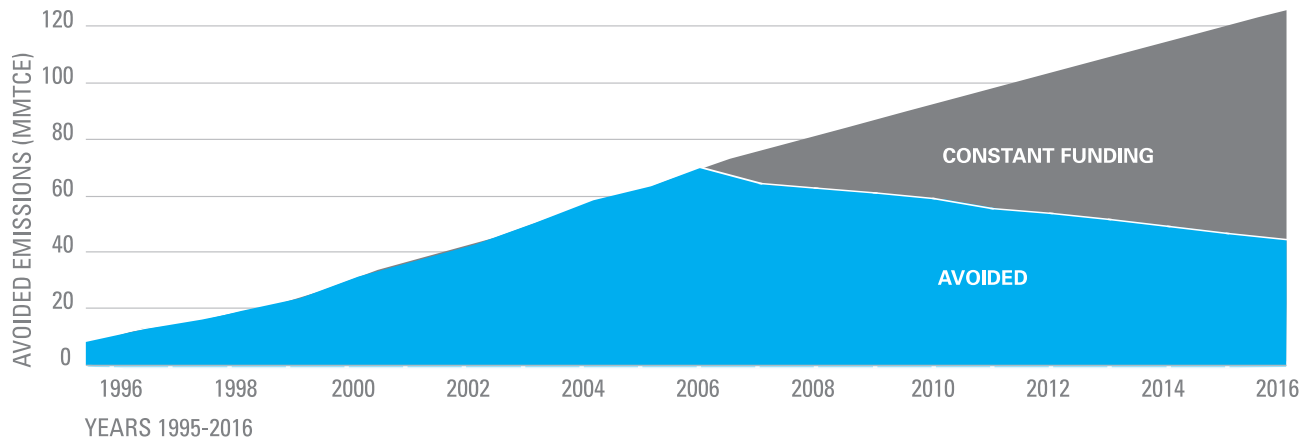
[4] Emissions do not include those used in mobile air conditioning or as replacements for ozone depleting substances.

TABLE 2. LONG-TERM GREENHOUSE GAS REDUCTION GOALS FOR EPA CLIMATE PARTNERSHIP PROGRAMS (MMTCE)

PROGRAM	ACCOMPLISHMENTS	GOALS	
	2006	2012	2015
ENERGY STAR*	37.6	52	64
Clean Energy Supply Programs	3.7	8	12
Methane Programs	16.1	18	20
High GWP Gas Programs	13.3	19	22
TOTAL	**70**	**97**	**118**

** Does not include ENERGY STAR products managed by DOE.*

FIGURE 4. POTENTIAL FOR ADDITIONAL GREENHOUSE GAS REDUCTIONS FROM EPA CLIMATE PARTNERSHIP PROGRAMS



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

INTERNATIONAL CLIMATE PROTECTION AWARD WINNERS

EPA established the Climate Protection Awards in 1998 to recognize outstanding accomplishments in protecting the Earth's climate. So far, 139 individuals, companies, and organizations from 16 countries have received the award. This year's 17 winners are reducing greenhouse gas emissions by improving energy efficiency, introducing new technologies, purchasing green power, and inspiring global action to protect the climate. The winners are from Australia, China, France, Japan, the United Kingdom, and the United States. Each winner serves as an example and inspiration for others to take action to protect the climate.

CORPORATE AWARD WINNERS

Entergy Corporation
New Orleans, LA

HSBC Holdings, plc
East London, UK

Mitsubishi Motors Corporation & Mitsubishi Heavy Industries
Tokyo, Japan

Red Dot Corporation
Seattle, WA

Staples, Inc.
Framingham, MA

The Yalumba Wine Company
Angaston, Australia

TEAM & NGO AWARD WINNERS

Arkema Climate Protection Team
France and USA

Climate Protection Campaign
Sonoma County, CA

Improved Mobile Air Conditioning Servicing Emissions Reduction Team
USA

Joint Strike Fighter Emissions Test Development Team
USA

Natural Resources Council of Maine
Portland, ME

INDIVIDUAL AWARD WINNERS

Reverend Sally Bingham
San Francisco, CA

Robert Parkhurst
San Francisco, CA

Robert Redford
Beverly Hills, CA

Auden Schendler
Aspen, CO

Ron Sims
King County, WA

Dadi Zhou
Beijing, China

INTRODUCTION TO EPA'S CLIMATE PROTECTION PROGRAMS

For almost 15 years, EPA's voluntary climate protection programs have helped break down market barriers that discourage cost-effective investments in energy efficiency, clean energy, and other climate-friendly technologies (see Table 3). These public-private partnerships provide objective information and technical assistance used by thousands of partners and their customers to reduce energy use, avoid greenhouse gas emissions, and hedge against volatile fuel markets. The programs also publicly recognize organizations that demonstrate exemplary environmental leadership.

As a result, these programs are capturing real financial and environmental benefits across the residential, commercial, and industrial sectors. The benefits increase every year as a growing number of partners take advantage of a wider array of tools and strategies offered by EPA's voluntary programs. The level of benefits achieved in 2006 is expected to double by 2016. In addition, EPA's suite of climate protection programs is an important component of the President's plan to reduce greenhouse gas intensity.

The programs summarized in this report[5] focus on the following strategies to achieve their environmental goals:

Corporate Commitments to Reducing Greenhouse Gas Emissions

Partners in EPA's Climate Leaders program are Fortune 500 and other leading corporations that have committed to aggressively reducing their greenhouse gas emissions. When they join the partnership, these companies agree to complete a comprehensive inventory of their greenhouse gas emissions, set an ambitious long-term reduction goal, and systematically report their progress to EPA. By investing in energy efficiency, clean energy, and measures to reduce emissions of other greenhouse gases, Climate Leaders are reducing their carbon footprint and earning recognition for environmental stewardship.

Energy Efficiency

Energy efficiency—obtaining identical services or output (such as heating, cooling, and lighting) with less energy input—offers one of the lowest cost means of reducing energy bills and addressing climate change. Since 1992, EPA has helped individuals and organizations nationwide adopt cost-effective, energy-efficient technologies and practices at work and at home through its ENERGY STAR program. These investments have:

- Avoided the emissions of the primary greenhouse gas, carbon dioxide (CO_2) (see Figure 5).
- Saved consumers and businesses up to 30 percent on their energy bills.
- Increased electricity reliability, lowered the volatility of energy prices, and improved energy security.

Clean Energy Supply

In 2001, EPA launched two partnership programs in fulfillment of the National Energy Policy—the Green Power Partnership and the Combined Heat and Power Partnership. Their mission is to increase the nation's supply of clean energy, which currently accounts for about 2 percent of U.S. electricity generated (see Figure 6), by promoting greater purchase of electricity derived from renewable sources and greater investment in environmentally friendly combined heat and power. Through these programs, EPA has since partnered with hundreds of organizations to provide technical assistance, minimize transaction costs, and promote technologies that significantly reduce greenhouse gas emissions from energy generation.

[5] This report provides results for the Climate Protection Partnership Programs operated by the Office of Atmospheric Programs at EPA. It does not include emissions reductions attributable to WasteWise, transportation programs, the Significant New Alternatives Program, or the landfill rule, which are the remaining actions in EPA's comprehensive climate program. EPA estimates that the reduction in greenhouse gas emissions across the entire set of climate programs to be about 100 MMTCE in 2006.

TABLE 3. MARKET BARRIERS ADDRESSED BY EPA'S CLIMATE PARTNERSHIP PROGRAMS

AUDIENCE OR TARGET MARKET	MARKET BARRIERS ADDRESSED	CLIMATE PROTECTION PARTNERSHIP PROGRAM			
		CLIMATE LEADERS	ENERGY STAR	GREEN POWER	COMBINED HEAT AND POWER
Energy Consumers	Lack of information about energy efficiency and renewable energy options		●	●	●
	Competing claims in the marketplace		●	●	
	Assessing objective measurement tools	●	●	●	
	Minimizing transaction costs	●	●	●	●
	Reliable technical assistance	●	●	●	●
	Peer exchange opportunities	●	●	●	●
	Overcoming split incentives		●		
	Understanding organizational risks	●	●	●	
	Incentives for action through recognition	●	●	●	●
Utilities	Assessing objective measurement tools	●	●	●	●
	Lack of information about energy efficiency program costs and benefits	National Action Plan for Energy Efficiency	●		●
	Disincentives for energy efficiency in existing regulations and energy planning processes	National Action Plan for Energy Efficiency			
Industries with Byproduct GHG Emissions*	Reliable technical assistance	Climate Leaders			
	Peer exchange opportunities	Methane Partnerships			
	Incentives for action through recognition	High GWP Partnerships			
State and Local Policy and Decisionmakers	Lack of information about clean energy policies	Clean Energy-Environment State Partnership			
	Reliable technical assistance	National Action Plan for Energy Efficiency			
	Incentives for action through recognition	Clean Energy-Environment Municipal Network			

** Includes utilities.*

FIGURE 5. U.S. CO_2 EMISSIONS BY SECTOR AND NON-CO_2 GASES BY PERCENT OF TOTAL GHGS

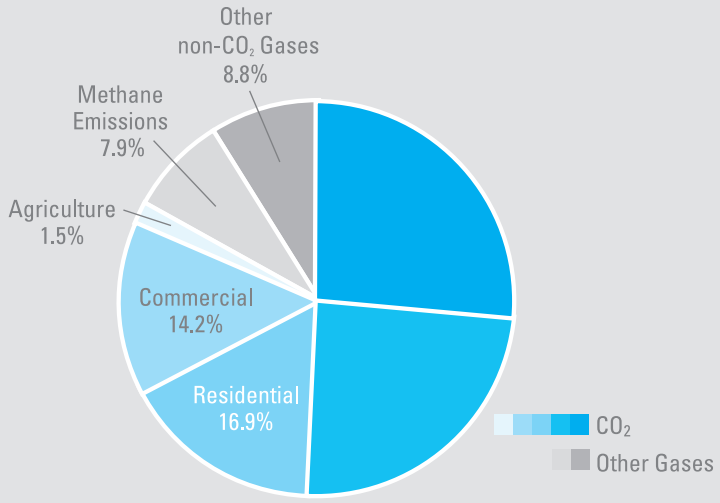
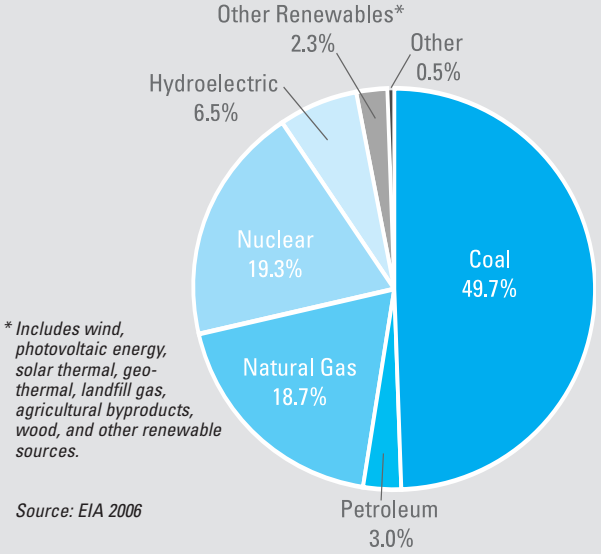


FIGURE 6. U.S. ELECTRICITY GENERATION BY FUEL TYPE



** Includes wind, photovoltaic energy, solar thermal, geo-thermal, landfill gas, agricultural byproducts, wood, and other renewable sources.*

Source: EIA 2006

State and Local Energy Policies

Significant informational and institutional barriers can prevent state and local entities from implementing policies and making investments that spur energy efficiency and clean energy development. Through the Clean Energy-Environment State Partnership and the Clean Energy-Environment Municipal Network, EPA provides state and local energy policymakers with tools and resources that allow them to explore, evaluate, and implement a variety of clean energy policies. EPA is also facilitating the National Action Plan for Energy Efficiency along with the U.S. Department of Energy (DOE). In addition to other EPA utility policy efforts, the Action Plan builds awareness of and provides guidance on how to overcome state policies that limit greater investment in energy efficiency by utilities and other third-party administrators of energy efficiency programs.

Non-CO_2 Greenhouse Gases

A number of greenhouse gases have a much greater ability to trap heat in the earth's atmosphere than carbon dioxide on a per molecule basis. Many of these gases are released as byproducts of industrial operations. EPA's climate partnerships are significantly reducing emissions of these gases, as described below:

- Methane is both a potent greenhouse gas and a highly desirable clean fuel. EPA partners with the natural gas, coal mining, agriculture, and landfill gas development industries to help them capture methane and use it as an energy source in a cost-effective manner.
- Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are all extremely powerful and persistent greenhouse gases. EPA is collaborating with many industries—including the aluminum, magnesium, semiconductor, and HCFC-22 industries, the electric utilities, and those engaged in mobile air-conditioning—to avoid significant accumulation of these gases in the atmosphere.

Demonstrating Progress in 2006

This report provides detailed information on EPA's efforts within each of the five program areas mentioned above (see Table 4). The sections that follow include program overviews, environmental and economic benefits achieved in 2006, and goals for the future. EPA is committed to documenting quantifiable program results and using well-established methods to estimate the benefits of its climate partnership programs. Specific approaches vary by program strategy, sector, availability of data, and market characteristics (see pages 40, 41, 44, 55, and 63). For each program, EPA addresses common issues that arise when estimating program benefits such as data quality, double counting, free-ridership, external promotion by third parties, and market effects, among others. The information presented in this annual report is similar to much of the information used in the U.S. Office of Management and Budget (OMB) Program Assessment Rating Tool (PART), which found these EPA programs to be achieving their goals.

TABLE 4. OVERVIEW OF EPA CLIMATE PARTNERSHIP PROGRAMS REVIEWED IN THIS ANNUAL REPORT WITH GREENHOUSE GAS REDUCTIONS SINCE 2000

PROGRAM	GHGS ADDRESSED	KEY SECTOR(S)	SCOPE OF PARTNERS AS OF 2006	GHG REDUCTIONS* (MMTCE)						
				2000	2001	2002	2003	2004	2005	2006
Climate Leaders	All	Commercial, Industrial	107	Climate Leaders' reductions are reflected in the data shown for other programs.						
ENERGY STAR	CO_2	Residential, Commercial, Industrial	9,000	15.4	19.1	23.3	27.5	31.8	33.8	37.6
Clean Energy-Environment State Partnership	CO_2	State Government	14						N/A	N/A
CLEAN ENERGY SUPPLY										
Green Power	CO_2	State & Local Government, Commercial, Industrial	650	N/A	N/A	0.6	1.0	2.0	3.2	3.7
Combined Heat and Power	CO_2	Commercial, Industrial	200							
METHANE PROGRAMS										
Natural Gas STAR	CH_4	Natural Gas	62% of industry	4.1	4.8	5.7	6.0	7.9	10.1	9.4
Coalbed Methane Outreach Program (CMOP)	CH_4	Coal Mining	N/A	2.1	2.3	1.7	1.7	2.0	2.1	1.9
Landfill Methane Outreach Program (LMOP)	CH_4	Waste Management	600	3.2	3.7	3.9	4.1	4.4	4.5	4.8
HIGH GWP GAS PROGRAMS										
Voluntary Aluminum Industrial Partnership	PFCs	Aluminum Smelting	98% of industry	2.0	2.1	1.8	2.2	2.2	2.3	2.4
HFC-23 Partnership	HFCs	Chemical Industry	100% of industry	4.7	5.1	4.5	6.1	6.4	6.2	7.0
Stewardship Programs	SF_6 PFCs	Magnesium Production, Semiconductor Manufacturing, Electric Power Systems	50%–100% of industry	0.8	0.8	1.3	1.8	3.1	3.0	3.8
Mobile Air Conditioning (MAC) Partnership	CO_2 HFCs	MAC Industry	N/A	Working toward technology improvement goals						

**These reductions reflect the most up-to-date data collected from EPA partners and may differ from reductions reported in previous annual reports.*
N/A: Not applicable

CLIMATE LEADERS

Since 2002, the Climate Leaders program has partnered with leading companies across the country to help them develop and implement long-term comprehensive climate change strategies. Climate Leaders partners represent a broad range of industry sectors including cement, forest products, pharmaceuticals, utilities, information technology, and retail (see Figure 7). They operate in all 50 states and provide 5.8 million jobs throughout the world. By joining the partnership, these organizations agree to complete a comprehensive inventory of their greenhouse gas emissions, set aggressive long-term reduction goals, and report their progress to EPA using clear measurement protocols.

EPA provides valuable guidance and opportunities for recognition to partners as they develop and work toward their climate reduction goals. Using EPA's wide range of tools, expertise, and resources, partners can make informed decisions about cost-effective strategies and practical portfolio investments in energy efficiency, clean energy, and non-CO_2 emissions reductions. EPA continuously tracks partner progress through a variety of means, and EPA ensures the credibility of reported data through detailed data reviews and site visits.

Climate Leaders has made substantial progress since its inception (see Table 5) and is well positioned to continue to assist its partners over the coming years.

Achievements in 2006

- The number of Climate Leaders partners grew to 107, an increase of more than 25 percent in just one year, with the addition of 30 new corporate partners. These companies represent more than 8 percent of total U.S. greenhouse gas (GHG) emissions.
- Three partners met their initial Climate Leaders GHG reduction goals in 2006: American Electric Power, St. Lawrence Cement, and United Technologies Corporation. These three companies join Baxter, General Motors, IBM, the National Renewable Energy Laboratory, and SC Johnson as the first eight to meet their initial goals since the program was launched in 2002 (see Table 6). Under the Climate Leaders program, once companies reach their initial targets, they continue to work with EPA to establish new goals.
- The total number of corporate GHG goals announced through 2006 grew to 59, including those announced by 21 partners in 2006 (see Table 7). More than half of the companies in the partnership have publicly announced GHG goals.
- EPA estimates that GHG reductions by Climate Leaders partners will prevent more than 10 million metric tons of carbon equivalent (MMTCE) per year relative to typical improvement activities. These reductions are equivalent to eliminating the annual GHG emissions from 7 million vehicles.
- Seventy-five partners submitted initial GHG inventories to EPA, a necessary step for all partners prior to establishing an emissions reduction goal. EPA technical experts performed 42 site visits to review partner GHG inventories and Inventory Management Plans and to recommend improvements.
- EPA released a user-friendly Annual Inventory Summary Form, draft Green Power Purchase accounting guidance, and additional draft offset protocols to provide rigorous, yet flexible, accounting principles and help companies manage their GHG emissions.
- EPA recognized those partners that have set emissions reduction goals through a public service announcement (PSA) and supplements that ran in 14 publications with a combined circulation of more than 6 million.

What to Expect in 2007 and Beyond

The Climate Leaders program will continue to recruit new partners and support existing partners as they develop and work toward their individual GHG reduction goals. EPA expects to welcome an additional 20 partners each year into the Climate Leaders program and for existing partners to announce 20 new corporate GHG reduction goals each year. Based on 2006 reports, four current partners are poised to attain their corporate climate change goals in 2007. EPA will develop recognition opportunities for partners that achieve major milestones.

TABLE 5. CLIMATE LEADERS KEY PROGRAM INDICATORS FOR 2004-2006

CLIMATE LEADERS INDICATOR	2004 CUMULATIVE	2005 CUMULATIVE	2006 CUMULATIVE
Partners	64	78	107
Initial Inventories Submitted	45	60	75
Site Visits	9	30	42
Goals Announced	25	38	59
Goals Achieved	0	5	8

TABLE 6. THREE CLIMATE LEADERS ACHIEVE THEIR CLIMATE PROTECTION GOALS IN 2006

PARTNER	GOAL ACHIEVED
American Electric Power *Columbus, OH*	Met its goal by reducing total U.S. GHG emissions by 4 percent from 2001 to 2006.
St. Lawrence Cement *Mont-Royal, Quebec*	Met its goal by reducing global GHG emissions by 16 percent per ton of cement-type product from 2000 to 2006.
United Technologies Corp. *Hartford, CT*	Met its goal of reducing global GHG emissions by 46 percent per dollar of revenue from 2001 to 2006.

TABLE 7. 21 CLIMATE LEADERS THAT SET AGGRESSIVE CLIMATE PROTECTION GOALS IN 2006

Baltimore Aircoil Company
Jessup, MD

California Portland Cement Company
Glendora, CA

Conservation Services Group
Westborough, MA

Cummins Inc.
Columbus, IN

DuPont Company
Wilmington, DE

Ecoprint
Silver Spring, MD

EMC Corporation
Hopkinton, MA

Entergy Corporation
New Orleans, LA

Haworth, Inc.
Holland, MI

HSBC North America
Prospect Heights, IL

Intel Corporation
Santa Clara, CA

Lockheed Martin Corporation
Bethesda, MD

Mack Trucks, Inc.
Allentown, PA

North Bay Construction
Petaluma, CA

Oracle Corporation
Redwood Shores, CA

Raytheon Company
Waltham, MA

Shaklee Corporation
Pleasanton, CA

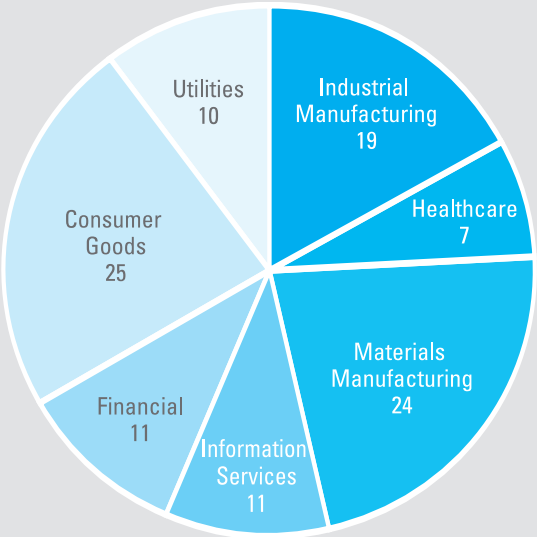
Sonoma Wine Company
Graton, CA

Sterling Planet, Inc.
Atlanta, GA

STMicroelectronics
Carrollton, TX

Volvo Trucks North America, Inc.
Greensboro, NC

FIGURE 7. THE 107 CLIMATE LEADERS BY SECTOR



ENERGY STAR OVERVIEW

Energy efficiency offers one of the lowest cost solutions for improving our energy security, reducing our energy bills, and addressing global climate change—all while helping to grow the economy. Since its inception in 1992, the ENERGY STAR program has helped individuals and organizations nationwide adopt cost-effective, energy-efficient technologies and practices and better manage their energy costs. And since 1996, the U.S. Department of Energy (DOE) has joined with EPA and assumed specific ENERGY STAR program responsibilities.

In 2006, the ENERGY STAR program offered more solutions to its widest audience ever in its efforts to overcome the informational, institutional, and practical obstacles that impede investment in energy-efficient technologies and practices. Nevertheless, numerous opportunities still exist for cost-effective energy efficiency investments in the residential, commercial, and industrial sectors. Given the rising concerns about the environmental, economic, and security implications of energy use, the nation's need to invest in energy efficiency is greater than ever.

The ENERGY STAR program serves as a credible, objective source of information for decisionmakers interested in improving the energy efficiency of their products, practices, services, homes, and buildings. By clearly identifying the financially attractive options that save energy, the ENERGY STAR program has helped consumers and organizations save money and protect the environment, and the program is poised to continue to do so into the future.

Achievements in 2006

The broad achievements across the ENERGY STAR program include the following:

- About $14 billion were saved by Americans on their utility bills across the residential, commercial, and industrial sectors (see Table 1, p. 3), largely by avoiding the need for more than 170 billion kilowatt hours (kWh) of electricity or almost 5 percent of the total 2006 U.S. electricity demand, and 35 gigawatts (GW) of peak power, equivalent to the generation capacity of more than 70 new power plants.
- More than 37 million metric tons of greenhouse gas emissions were avoided, equivalent to the greenhouse gas emissions from 25 million vehicles (see Table 8).
- These benefits were achieved by identifying and promoting the purchase of efficient products and new homes (40 percent) and by promoting improved energy management strategies for organizations in the commercial and industrial sectors based on standardized approaches for assessing current levels of efficiency, targeting improvements, and tracking success (60 percent).
- About 300 million ENERGY STAR qualified products are being purchased each year, and about 12 percent of all new homes built in 2006 earned the ENERGY STAR.[6] A summary of other key indicators from all the program areas is provided in Table 9.[7]
- Nationwide awareness of ENERGY STAR continued to grow, and it is now recognized by more than 65 percent of the American public. Further, there were more than 4 million visits to the ENERGY STAR Web site in 2006, and media articles mentioning ENERGY STAR qualified products, homes, and buildings reached more than one billion consumers in 2006.

The ENERGY STAR program now engages more than 9,000 businesses and organizations across the country to advance energy-efficient buildings, products, practices, homes, and services that lower energy bills and benefit the environment. These partners include:

- About 1,700 manufacturers using the ENERGY STAR to distinguish the energy efficiency of over 40,000 individual product models across more than 50 product categories, many carrying the brand names that today's consumers prefer. These products offer consumers savings of up to 90 percent relative to standard models and up to 30 percent savings in total on their household energy bills (see Table 10, p. 16).
- More than 900 retail partners bringing ENERGY STAR qualified products and educational information to their customers.

[6] Single-family site-built new homes

[7] This cumulative total includes product sales across the entire ENERGY STAR program, including those from the efforts of the Department of Energy. The results for energy saved and the resulting environmental and economic benefits represent EPA efforts alone.

TABLE 8. ENERGY STAR PROGRAM ACHIEVEMENTS EXCEED GOALS IN 2006

	2006				2007	
	Energy Saved (Billion kWh)		Emissions Avoided (MMTCE)		Energy Saved (Billion kWh)	Emissions Avoided (MMTCE)
	Goal	Achieved	Goal	Achieved	Goal	Goal
All Qualified Products[1]	0.0	75.2	14.5	15.5	—	16.0
Commercial Building Improvements[2]	0.0	76.5	11.5	15.2	—	12.5
New Homes[3]	0.0	1.4	0.5	0.4	—	0.9
Industrial Improvements[4]	0.0	22.3	3.7	6.5	—	3.9
PROGRAM TOTAL for ENERGY STAR	**130.0**	**175.4 [5]**	**30.2**	**37.6**	**150**	**33.3**

Achievements By Product Type

	Energy Saved 2006 (Billion kWh)	Emissions Avoided 2006 (MMTCE)
Consumer Electronics[6]	12.3	2.4
Residential Appliances[7]	0.6	0.1
Residential Office Equipment	6.3	1.2
Lighting	11.3	2.2
Heating and Cooling	7.6	2.4
Residential Products	**38.1**	**8.4**
Commercial Appliances	1.3	0.3
Office Equipment	28.5	5.6
Commercial Lighting	1.7	0.3
Other	5.5	1.0
Commercial Products	**37.1**	**7.1**

[1] Results for qualified products from Sanchez et al., 2007. [2] Results from building improvements based on methodology presented in Horowitz, 2007. [3] Results for qualified homes from CPPD, 2007. [4] Electricity results from industrial improvements based on methodology presented in Horowitz, 2007; results from other fuels from ICF International, 2006. [5] The kWh savings imply peak demand savings of more than 35 gigawatts (GW), based on conservation load factors developed by LBNL (Koomey et al., 1990). [6] A small portion of consumer electronics may be used in commercial buildings such as hotels. For reporting purposes, all consumer electronics results are included under Residential Products. [7] EPA results only, does not include products under the responsibility of DOE. Totals may not equal sum of components due to independent rounding.

—: Not applicable

TABLE 9. ENERGY STAR KEY PROGRAM INDICATORS, 2000 AND 2006

	INDICATOR	2000	2006
QUALIFIED PRODUCTS	Products Sold**	600 million	>2 billion
	Product Categories	40	>50
	Product Models	11,000	40,000
	Public Awareness	40%	68%
	Retailers (partners)	25	900
NEW HOMES	New Homes Built**	25,000	725,000
	Home Builders (partners)	1,600	3,500
COMMERCIAL BUILDINGS	Buildings Rated**	4,200	30,000
	Buildings Labeled**	545	3,200
	Building Types Eligible for Label	2	11
INDUSTRIAL IMPROVEMENTS	Industry Focuses	0	10
ANNUAL RESULTS	Energy Saved (kWh)	62 billion	170 billion
	Avoided Emissions (MMTCE)	15.8	37.6
	Net Savings (USD)	$5 billion	$14 billion

*** Results are cumulative.*

- Close to 3,500 builder partners constructing new homes that qualify for the ENERGY STAR in every state and the District of Columbia.
- About 2,500 private businesses and public sector organizations investing in energy efficiency and reducing energy use in their buildings and facilities.
- More than 40 states, 500 utilities, and many other energy efficiency program sponsors leveraging ENERGY STAR to improve the efficiency of commercial buildings and homes.
- Hundreds of energy service providers, energy raters, architects, building engineers, and financial lenders making energy efficiency more widely available through ENERGY STAR and providing additional value to their customers.

The success of ENERGY STAR depends on the efforts of its partners, and EPA and DOE recognized 92 of them in 2006 at the ENERGY STAR annual awards for their outstanding efforts to advance energy efficiency in the United States (see p. 17).

EPA continued to work with international partners. It maintained its international collaboration under the Asia Pacific Partnership as well as renewed its ENERGY STAR agreement with the European Union on specifications for ENERGY STAR office equipment. EPA also agreed to cooperate with the China Standard Certification Center (CSC) in standardizing information on their respective energy efficiency labels for consumer electronics and office equipment.

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

TABLE 10. ENERGY STAR QUALIFIED PRODUCTS

ENERGY STAR PRODUCT CATEGORY	AVERAGE ENERGY SAVINGS** ABOVE STANDARD PRODUCT	ENERGY STAR PRODUCT CATEGORY	AVERAGE ENERGY SAVINGS** ABOVE STANDARD PRODUCT
OFFICE		**LIGHTING**	
Monitors	20-60%	Compact fluorescent light bulbs (CFLs)*	75%
Computers	5-55%	Residential light fixtures	75%
Fax machines	20%	**RESIDENTIAL APPLIANCES**	
Copiers	20%	Room air conditioners*	10%
Multifunction devices	20%	Dehumidifiers	15%
Scanners	50%	Room air cleaners	45%
Printers	10%	Exhaust fans	70%
CONSUMER ELECTRONICS		Ceiling fans	45%
TVs	25%	Dishwashers*	40%
VCRs	30%	Refrigerators*	15%
TVs/DVDs/VCRs	90%	Clothes washers*	25%
DVD products	60%	**COMMERCIAL APPLIANCES**	
Audio equipment	60%	Water coolers	45%
Telephony	55%	Commercial solid door refrigerators and freezers	35%
External power supplies	35%	Commercial hot food holding cabinets	60%
Battery charging systems	35%	Commercial fryers	15%
HEATING AND COOLING		Commercial steamers	50%
Furnaces	15%	Vending machines	25%
Central air conditioners	15%	**HOME ENVELOPE**	
Air source heat pumps	10%	Insulation/Sealing	N/A
Geothermal heat pumps	30%	Roofing	N/A
Boilers	5%	Windows, doors, & skylights*	N/A
Programmable thermostats	15%		
Light commercial HVAC	5%		

** DOE managed products*
*** Actual savings will vary by climate region and home characteristics.*

ENERGY STAR AWARD WINNERS

SUSTAINED EXCELLENCE

3M
St. Paul, MN

Advantage IQ
Spokane, WA

Astoria Homes
Las Vegas, NV

Austin Energy
Austin, TX

California Portland Cement Company
Glendora, CA

CenterPoint Energy
Houston, TX

David Powers Homes
Houston, TX

Ence Homes
St. George, UT

Food Lion, LLC
Salisbury, NC

GE Consumer & Industrial
Louisville, KY

Giant Eagle, Inc.
Pittsburgh, PA

Gorell Enterprises, Inc.
Indiana, PA

Marriott International, Inc.
Washington, DC

Nevada ENERGY STAR Partners
Las Vegas, NV

New York-Presbyterian Hospital
New York, NY

New York State Energy Research and Development Authority
Albany, NY

OSRAM SYLVANIA
Danvers, MA

Save More Resources
Dallas, TX

Sea Gull Lighting Products, LLC
Riverside, NJ

Toyota Motor Engineering & Manufacturing North America, Inc.
Erlanger, KY

Transwestern
Houston, TX

TXU Electric Delivery
Dallas, TX

USAA Real Estate Company
San Antonio, TX

Veridian Homes
Madison, WI

Whirlpool Corporation
Benton Harbor, MI

Wisconsin Focus on Energy
Madison, WI

PARTNER OF THE YEAR–RETAILER

The Home Depot, Inc.
Atlanta, GA

PARTNER OF THE YEAR–PRODUCT MANUFACTURER

AGA Foodservice Equipment
Cherry Hill, NJ

Lennox Industries Inc.
Richardson, TX

Pella Corporation
Pella, IA

Precision Entry, Inc.
Sugarcreek, OH

Progress Lighting
Greenville, SC

EXCELLENCE IN ENERGY STAR PROMOTION

Bosch Home Appliances
Huntington, CA

Georgia Power
Atlanta, GA

Long Island Power Authority
Uniondale, NY

Lowe's Companies, Inc.
Mooresville, NC

Nationwide Marketing Group
Winston-Salem, NC

Northeast ENERGY STAR Lighting and Appliance Initiative
Lexington, MA

Rocky Mountain Power
Salt Lake City, UT

The National Energy Education Development Project
Manassas, VA

EXCELLENCE IN APPLIANCE RETAILING

Sears Holdings
Hoffman Estates, IL

PARTNER OF THE YEAR–ENERGY EFFICIENCY PROGRAM DELIVERY

Arizona Public Service (APS)
Phoenix, AZ

Building Owners and Managers Association (BOMA) International
Washington, DC

Northwest Energy Efficiency Alliance
Portland, OR

Pacific Gas and Electric Company
San Francisco, CA

Southern California Edison
Rosemead, CA

Southern California Gas Company
Los Angeles, CA

PARTNER OF THE YEAR–ENERGY MANAGEMENT

Davenport Community School District
Davenport, IA

Ford Motor Company
Dearborn, MI

J.C. Penney Company, Inc.
Plano, TX

Jones Lang LaSalle
Chicago, IL

McDonald's USA
Oak Brook, IL

Merck & Co., Inc.
Whitehouse Station, NJ

PepsiCo
Purchase, NY

Raytheon Company
Waltham, MA

San Diego Unified School District
San Diego, CA

Seaford School District
Seaford, DE

Shriners Hospitals for Children -Houston
Houston, TX

PARTNER OF THE YEAR–SERVICE AND PRODUCT PROVIDER

Schools for Energy Efficiency from Hallberg Engineering, Inc.
White Bear Lake, MN

EXCELLENCE IN ENERGY-EFFICIENT AFFORDABLE HOUSING

Community Housing Partners Corporation
Christiansburg, VA

Enterprise
Columbia, MD

Houston Habitat for Humanity
Houston TX

Louisville Metro Housing Authority
Louisville, KY

New Jersey Green Homes Office -NJ Department of Community Affairs
Trenton, NJ

Pennsylvania Housing Finance Agency
Harrisburg, PA

Philadelphia Housing Authority
Philadelphia, PA

EXCELLENCE IN HOME IMPROVEMENT

Efficiency Vermont
Burlington, VT

National Grid
Westborough, MA

PARTNER OF THE YEAR–NEW HOMES

Advanced Energy
Raleigh, NC

Anderson Homes, Inc.
Cary, NC

Bob Ward Companies
Edgewood, MD

Bosgraaf Homes
Holland, MI

CMH Manufacturing, Inc.
Maryville, TN

DPIS Engineering, LLC
Tomball, TX

Energy Inspectors
Las Vegas, NV

Energy Services Group
Wilmington, DE

Fox Energy Specialists, The Nelrod Company
Fort Worth, TX

Haven Properties
Alpharetta, GA

Holton Homes Inc.
Nampa, ID

K. Hovnanian Homes - Minnesota Division
Eden Prairie, MN

Palm Harbor Homes
Addison, TX

Southern Energy Management
Raleigh, NC

Southwest Energy Conservation, LLC
El Paso, TX

The Commodore Corporation
Goshen, IN

Winton/Flair Custom Homes
El Paso, TX

SPECIAL RECOGNITION–EXCELLENCE IN EFFICIENCY

Denton Affordable Housing Corporation
Denton, TX

Energy Trust of Oregon, Inc.
Portland, OR

Innovative Design, Inc.
Raleigh, NC

Nashville Area Habitat for Humanity
Nashville, TN

Seattle Lighting
Seattle, WA

Worcester East Side Community Development Corporation
Worcester, MA

U.S. Department of Housing and Urban Development
Region I, Bob Paquin
Region IV, Jim Chaplin
Region VI, Laurence Doxsey
Region IX, Wayne Waite

ENERGY STAR IN THE RESIDENTIAL SECTOR

Driven by high utility bills at home and growing interest in "green" products and practices, American consumers are turning to ENERGY STAR to help guide their purchasing decisions so they can make their homes more efficient, save money, and prevent greenhouse gas emissions (see Figure 8). By using ENERGY STAR qualified products and services, households can reduce their energy use up to 30 percent and save $600 a year on their utility bills without sacrificing comfort or performance. Through ENERGY STAR, EPA helps consumers purchase energy-efficient products and make cost-effective home improvements while helping to protect the environment.

ENERGY STAR Products for the Home

Each year, EPA expands the ENERGY STAR program so that it retains its role as the leading authority on cost-effective energy efficiency. Activities in 2006 included adding new qualified products, updating specifications for select products (see Table 11), continuing national and international government coordination, and promoting broad outreach efforts that help consumers find ENERGY STAR products, homes, and services. Highlights of these activities are described below.

New ENERGY STAR Products. Small household appliances represent a rapidly expanding share of household energy use. Battery charging systems, which recharge a wide variety of cordless products including power tools, personal care products, garden tools, and other small appliances, represent a significant portion of that household energy use. In 2006, EPA further extended its coverage of small household appliances by establishing a new ENERGY STAR specification for battery charging systems (see below). On average, ENERGY STAR qualified battery charging systems use 35 percent less energy than conventional models.

Raising the Bar for ENERGY STAR. In 2006, EPA significantly improved the efficiency of a broad range of office equipment products, without making any tradeoffs in features or functionality. New ENERGY STAR specifications for copiers, printers, faxes, scanners, multifunction devices, and computers were finalized—all addressing active power for the first time. The updated specifications marked the completion of a comprehensive global process to develop new, broadly accepted, standardized test procedures for measuring active power in these products.

Growing Awareness. EPA published a report, "National Awareness of ENERGY STAR for 2006," which summarizes the findings of a Consortium for Energy Efficiency (CEE) survey and highlights ENERGY STAR's role in helping American consumers make energy-efficient choices that are also good for the environment. The results of the CEE survey are summarized below.

- Public awareness of the ENERGY STAR label exceeds 65 percent (see Figure 9). Public awareness is even greater—75 percent—in major markets where local utilities and other organizations use ENERGY STAR to promote energy efficiency to their customers.

ENERGY STAR

Powered by an ENERGY STAR® qualified adapter for a better environment

EPA Targets Growing Source of Household Energy Use by Introducing Battery Charger Specification in 2006

Further expanding its coverage of small household appliances, EPA established a new ENERGY STAR specification for battery chargers in 2006. Battery charging systems recharge a wide variety of cordless products, including power tools, small household appliances, personal care products, and garden tools. On average, ENERGY STAR qualified battery chargers use 35% less energy than conventional models. They have the potential to save Americans more than $100 million in energy costs annually, while preventing more the one million tons of greenhouse gas emissions.

PRODUCTS USING BATTERY CHARGERS

- power tools
- small household appliances
- personal care products
- garden tools

TABLE 11. ENERGY STAR RESIDENTIAL PRODUCT SPECIFICATIONS ADDED, REVISED, AND IN PROGRESS

PRODUCT CATEGORY	YEAR INTRODUCED AND (YEAR REVISED)	RESPONSIBLE AGENCY	STATUS OF ACTIVITY IN 2006
2006 New Specifications			
Battery Charging Systems	2006	EPA	New specification took effect in 2006.
2006 Revisions Completed			
Computers	1992 (2006)	EPA	Revision completed. Revised specification to take effect in 2007.
Imaging Equipment	1993 (1994, 1995, 1997, 2006)	EPA	Revision completed. Revised specification to take effect in 2007.
Oil Furnaces	1995 (2006)	EPA	Revision completed. Revised specification to take effect in 2007.
2006 Revisions in Progress			
Furnaces	1995	EPA	In progress.
Programmable Thermostats	1995	EPA	In progress.
Residential Lighting Fixtures	1997 (2001, 2002, 2003, 2005)	EPA	Revision initiated in 2006.
Roof Products	1999 (2003)	EPA	In progress.
Televisions	1998 (2002)	EPA	In progress.
New Specifications in Development			
Digital TV Adapters		EPA	New specification to be completed in 2007.

FIGURE 8. OVER 2 BILLION ENERGY STAR QUALIFIED PRODUCTS SOLD SINCE 1992

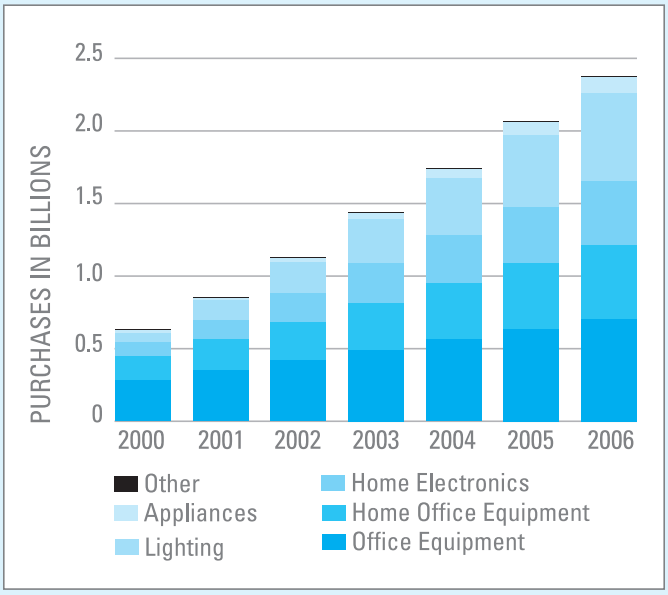
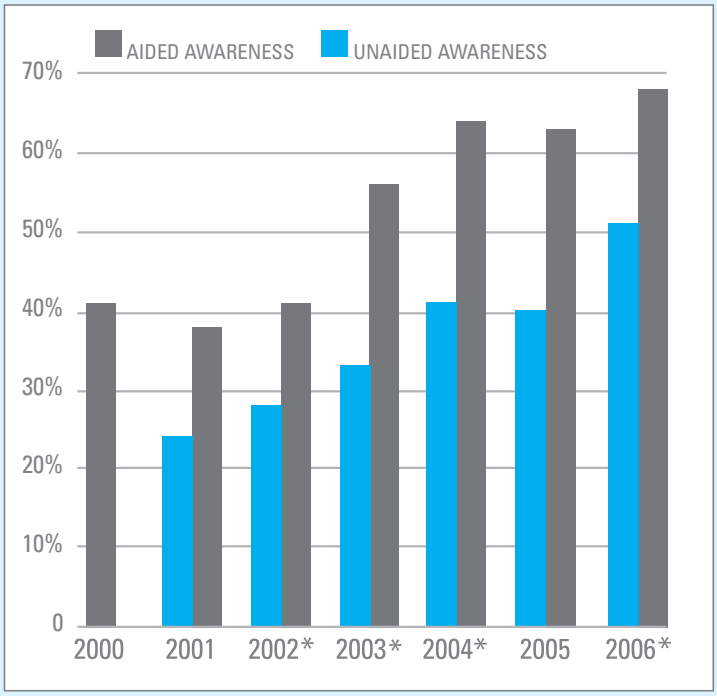


FIGURE 9. AWARENESS OF ENERGY STAR GROWING IN THE UNITED STATES



** Annual result is statistically different from the result of the prior year.*

- More than 60 percent of households reported being favorably influenced by the ENERGY STAR label.
- More than 30 percent of households knowingly purchased an ENERGY STAR qualified product or appliance in the past year.
- More than 70 percent of these households reported they are likely to recommend ENERGY STAR products to their friends, with 29 percent of households reporting they are "extremely likely" to do so.

Public Outreach. One core activity of the ENERGY STAR program is to educate the public about the environmental and financial benefits of ENERGY STAR products. The 2006 ENERGY STAR national campaigns and public service announcements (PSAs) reached millions of people through TV, magazine, radio, and other media outlets. As a result, EPA is on track to exceed the 2010 ENERGY STAR national awareness goal of 70 percent.

- **Leadership in "Green."** With campaigns that broaden exposure and public understanding, ENERGY STAR is a trusted source of objective energy efficiency guidance for consumers. In 2006, EPA used new tactics, reached new audiences, and adopted a social marketing model for some campaigns. As the demand for "green" products rises in the future, EPA will continue to position ENERGY STAR as an easy, cost-effective way to make environmentally responsible purchasing decisions.
- **ENERGY STAR *Change a Light, Change the World* Campaign.** This year, the ENERGY STAR *Change a Light, Change the World* Campaign added a community-based social marketing element to its traditional marketing and media approach to personally involve more Americans. In addition, organizations and businesses were invited to set a pledge goal and encourage their employees, members, or networks to take the ENERGY STAR Change a Light pledge. More than 600 organizations in all 50 states sponsored pledge drives or hosted events to support the campaign (see Figure 10). Overall, the campaign has generated more than 500,000 pledges to replace a traditional light bulb with an ENERGY STAR qualified compact fluorescent light bulb.
- **ENERGY STAR @ Home.** As part of the 2006 *Cool Your World* with ENERGY STAR campaign, EPA launched ENERGY STAR @ home, an interactive Web tool that helps consumers better understand how energy is used in their homes (see p. 21). The tool is updated seasonally to give consumers weather appropriate practical tips to lower home energy costs and prevent greenhouse gas emissions. ENERGY STAR @ home garnered media attention in national and local news broadcasts and long-lead print publications. The site was featured by syndicated writers, retailers, and high-profile online outlets, such as MTV.com, MSN.com, and BHG.com. By the end of 2006, the ENERGY STAR @ home tool had been used more than 200,000 times.

PARTNER OF THE YEAR—RETAILER

THE HOME DEPOT *Atlanta, Georgia*

The Home Depot's second Retail Partner of the Year Award was well deserved. In 2006, The Home Depot raised the bar by carrying more ENERGY STAR products than ever and increasing qualified product sales to 82 million. This leading home improvement retailer helped its customers save more than $300 million and prevented greenhouse gas emissions equivalent to those from more than 400,000 vehicles. Home Depot also increased the presence of ENERGY STAR through a variety of media channels, including a partnership with AOL to promote ENERGY STAR products and projects, and a *Change a Light, Change the World* campaign sweepstakes with a Ford Escape Hybrid prize.

PARTNER OF THE YEAR—PRODUCT MANUFACTURER

LENNOX INDUSTRIES INC. *Richardson, Texas*

Lennox Industries has been a leading manufacturer of commercial and residential indoor comfort systems—also known as heating, ventilating, and air conditioning—for more than a century. In 2006, Lennox aggressively marketed new ENERGY STAR qualified products; as a result, its U.S. residential equipment sales increased 32% over 2005, and commercial split heating and cooling systems rose 54%. Lennox's 2006 campaign, "Bad Air," showcased ENERGY STAR qualified products and generated nearly 2 billion consumer impressions across various media. Lennox has distinguished itself as a leader by embracing the goals of the ENERGY STAR program while providing additional value to its customers.

Highlights of more 2006 Award winners may be found at energystar.gov/awards.

EPA LAUNCHES INTERACTIVE ENERGY STAR @ HOME WEB TOOL AS PART OF THE ENERGY STAR *COOL YOUR WORLD* CAMPAIGN

In May 2006, EPA launched ENERGY STAR @ home, a new online educational tool for residential energy efficiency, as part of the annual ENERGY STAR *Cool Your World* campaign.

With ENERGY STAR @ home, consumers learn how to reduce energy use, save money on their utility bills, and increase home comfort through an engaging and interactive format. Users can explore an online house room-by-room, discovering information on energy-efficient products, ideas for home improvement, and tips on energy-saving practices. The tool is available year-round with a changing seasonal and promotional focus. In 2006, the ENERGY STAR @ home tool was used more than 200,000 times.

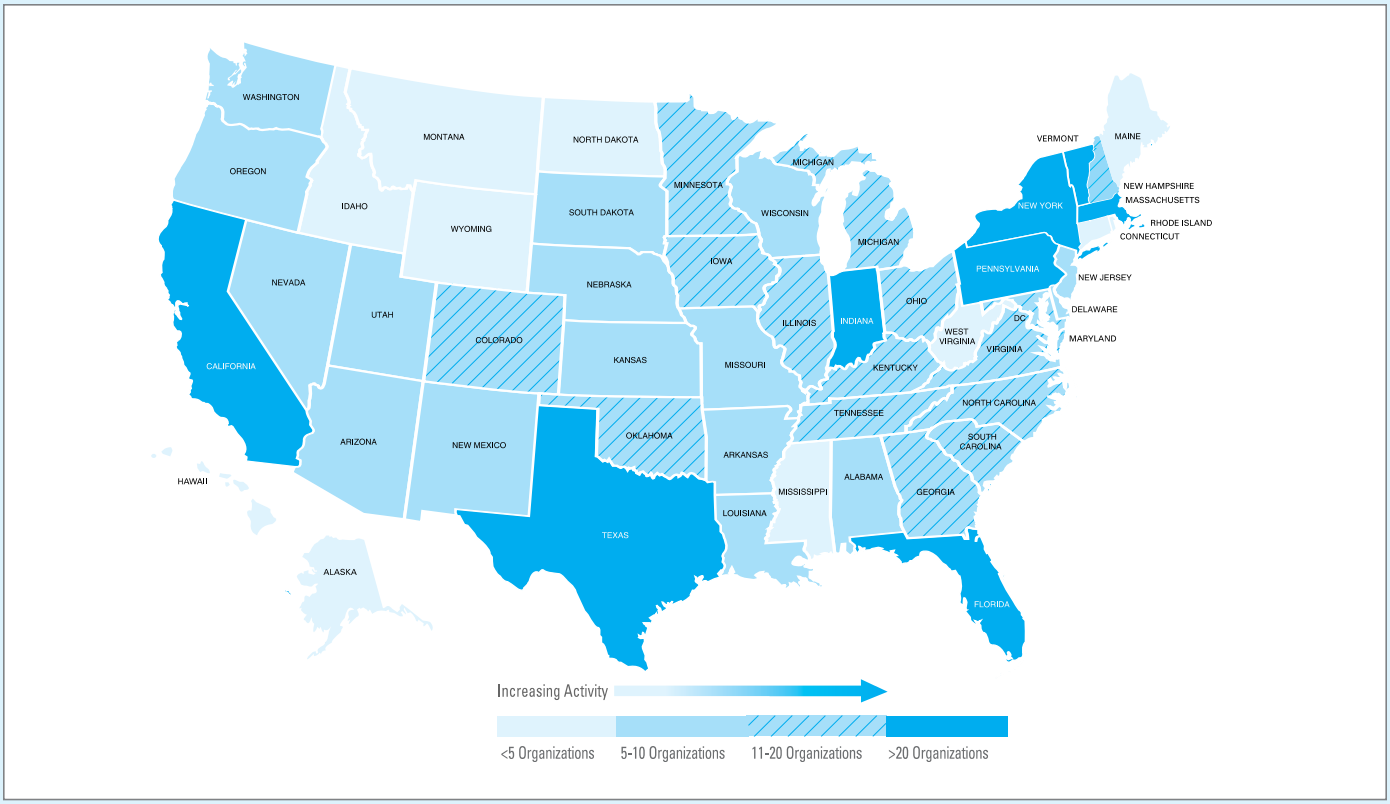
ENERGY STAR @ home has provided many of EPA's retail partners an easy way to promote energy efficiency and energy-saving advice both in-store and online. National retailers, such as Lowe's, Menards, Sears, and The Home Depot, have linked to ENERGY STAR @ home from their Web sites, with several also using the tool in their advertisements and in-store materials. Lowe's featured ENERGY STAR @ home in a national prime time television commercial.

The increased national media interest in energy-related stories during the summer of 2006 led to other substantial media placements of the ENERGY STAR @ home tool. Articles mentioning the tool and the Cool Your World messaging appeared in *Reader's Digest* and *Home* magazines. A syndicated story about ENERGY STAR @ home ran in major online and print news outlets such as ABCNews.com, Yahoo.com, HoustonChronicle.com, WashingtonPost.com, and BostonGlobe.com. EPA also forged new partnerships with online content providers, such as BHG.com (Better Homes and Gardens), MSN.com, Lime.com, and MTV.com, that posted links to ENERGY STAR @ home and the Cool Your World messaging. The combined media coverage resulted in more than 27 million earned media impressions.

Building on the tremendous success of the 2006 campaign, EPA will continue to promote ENERGY STAR @ home as a way to educate Americans on protecting the environment by reducing energy use at home. Through a new feature for the 2007 campaign, "Tell Us How You Save," homeowners will be able to share their energy-saving home improvement stories, demonstrating simple ways that individuals can do their part to protect the environment while saving money on their utility bills.

To explore the tool, visit www.energystar.gov/home.

FIGURE 10. MORE THAN 600 ORGANIZATIONS PROMOTE ENERGY STAR *CHANGE A LIGHT, CHANGE THE WORLD* IN 2006



Home Improvement through ENERGY STAR

EPA continues to promote energy-efficient improvements and remodeling that range from do-it-yourself air sealing and insulation projects to large whole-house remodeling by qualified contractors. The home improvement market continues to grow rapidly, topping $280 billion in sales in 2005.[8] More and more homeowners are taking the opportunity to make efficiency improvements at the time of renovations—lowering their utility bills while improving the value and comfort of the home.

Home Performance with ENERGY STAR. Home Performance with ENERGY STAR is part of EPA's effort with DOE to promote whole-house, energy efficiency retrofits through a qualified contractor network that is backed up by a quality assurance program. EPA estimates that a typical home could save, on average, more than 20 percent of its total energy and between $400 and $500 a year if these retrofits were made. Current participants in the program are experiencing savings of up to 50 percent for homes needing the most repairs. Under Home Performance with ENERGY STAR, regional sponsors implement the program by recruiting and training contractors, marketing contractor services, and overseeing the quality of their work.

- In 2006, more than 12,000 Home Performance with ENERGY STAR retrofits were reported to program sponsors, bringing the total number of jobs performed under this program close to 28,000 retrofits.
- New program sponsors joined existing sponsors to spur continued program growth (see Figure 11). Long Island Power Authority (LIPA) and the states of New Jersey and Maine established programs in 2006.
- EPA, in conjunction with DOE and the U.S. Department of Housing and Urban Development (HUD), continued to support the Building Performance Institute (BPI) through its 3-year grant to develop a contractor infrastructure to deliver home performance contracting. BPI reported more than 1,200 certified contractors in 31 states in 2006.
- EPA recognized five partners—Austin Energy, Efficiency Vermont, National Grid, New York State Energy Research and Development Authority (NYSERDA), and Wisconsin Focus on Energy—for their successful implementation of Home Performance with ENERGY STAR (see pp. 22 and 23).

Proper HVAC Installation. EPA estimates that improperly sized and installed HVAC systems can reduce system performance by as much as 30 percent and that more than half of all systems are installed incorrectly. In 2006, EPA piloted a proper heating, ventilation, and air conditioning (HVAC) installation program with Pacific Gas and Electric (PG&E). The results of this pilot and others to be completed in 2007 will serve as the basis for a national roll-out of an ENERGY STAR HVAC Quality Installation (QI) program in 2008.

ENERGY STAR Home Sealing. Air sealing and insulation are among the easiest and most cost-effective ways to reduce energy bills and increase comfort in a home. However, more than 40 percent of American households experience drafts during the winter,[9] an indication of poor sealing. ENERGY STAR Home Sealing is working to address the problem. In 2006, EPA—in conjunction with major retailers, utilities, and regional energy efficiency advocates—distributed more than 30,000 copies of the *Do-It-Yourself (DIY) Guide to ENERGY STAR Home Sealing* in both English and Spanish.

Partnering with DOE and HUD. In 2006, the three agencies reported their first year's results for the Partnership for Home Energy Efficiency (PHEE). Announced in 2005, this partnership is committed to using established energy efficiency programs to reach its goal of a 10-percent reduction in average home energy consumption by 2015. The program leverages the efforts of EPA, DOE, and HUD.

EXCELLENCE IN HOME IMPROVEMENT

EFFICIENCY VERMONT *Burlington, Vermont*

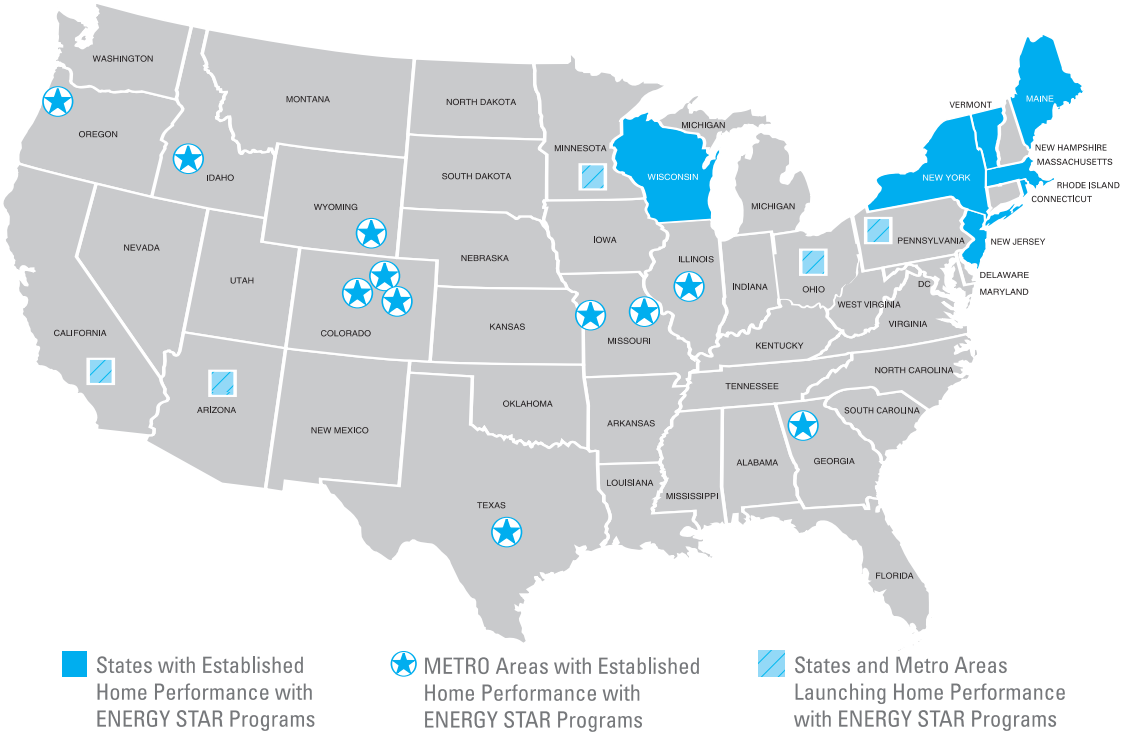
Efficiency Vermont

In 2006, Efficiency Vermont made a committed effort to inform Vermont homeowners and contractors about the value of Home Performance with ENERGY STAR. Efficiency Vermont's primary strategy has been to build and promote a market infrastructure that has the building-science expertise necessary to address consumer needs while raising awareness about the benefits of Home Performance with ENERGY STAR. Building on 3 years of promoting energy efficiency best practices, Efficiency Vermont also sponsored four 8-day contractor training sessions, which resulted in 18 contractors being certified to deliver whole-house services across the state.

[8] Joint Center for Housing Growth, Harvard University, 2007.

[9] Energy Information Administration (EIA), 2001.

FIGURE 11. HOME PEFORMANCE WITH ENERGY STAR SPREADS ACROSS THE COUNTRY



SUSTAINED EXCELLENCE AWARD

WISCONSIN FOCUS ON ENERGY *Madison, Wisconsin*

Wisconsin Focus on Energy is an innovative partnership of organizations that works to promote ENERGY STAR qualified new homes, Home Performance with ENERGY STAR, and ENERGY STAR qualified products across the state. Nearly 230 builders are following the Wisconsin ENERGY STAR Homes guidelines, with more than 7,600 ENERGY STAR new homes built through the program since 1999. Under Wisconsin's Home Performance with ENERGY STAR, nearly 6,000 existing homes have been improved, including 1,600 in 2006. Wisconsin Focus on Energy educates businesses and consumers on the value of ENERGY STAR through training events for builders and contractors, multi-media advertising, and participation in trade shows and other events. All together, its outreach efforts reached over one million people in 2006. Wisconsin Focus on Energy also promotes ENERGY STAR qualified lighting and appliances, saving 50 million kWh and preventing the release of more than 60,000 tons of carbon dioxide in 2006.

AUSTIN ENERGY *Austin, Texas*

For the third year in a row, Austin Energy was recognized for its success under Home Performance with ENERGY STAR. In 2006, nearly 2,000 households participated—collectively saving more than 4.4 megawatts of energy and preventing the release of more than 2 tons of carbon into the atmosphere. The company continued to develop contractors' expertise by offering certification and accreditation under two nationally recognized programs, reaching out to realtor groups and new home buyers, and promoting ENERGY STAR to the Spanish-speaking community. Austin Energy garnered national recognition when the PBS Program, *This Whole House*, spotlighted an Austin home renovation project. Austin Energy's strong efforts serve as a model for many developing programs throughout the country.

Highlights of more 2006 Award winners may be found at energystar.gov/awards.

ENERGY STAR Qualified New Homes

2006 was the most successful year to date for ENERGY STAR in the new homes market. Despite a downturn in the new home construction market at year end, the market penetration of ENERGY STAR qualified new homes went up to 12 percent in 2006, an increase over 2005—proving builders know that consumers value the comfort, quality, and energy savings found in ENERGY STAR qualified homes.

Twelve Percent of New Homes Nationwide Bear the ENERGY STAR Label. Close to 200,000 ENERGY STAR qualified new homes were built nationwide in 2006, bringing the total to almost 725,000 (see Figure 12). ENERGY STAR homes are available in every state across the country and the District of Columbia; and in 10 states and more than 20 metropolitan areas, more than 20 percent of new homes earned the label (see Figure 13). As a result, homeowners are saving more than $170 million a year on their utility bills while experiencing greater comfort and superior indoor air quality.

Growing Number of Companies Partner with ENERGY STAR New Homes. Nearly 3,500 builders partnered with EPA to construct ENERGY STAR qualified new homes in 2006, a 30 percent increase since 2005. More than 40 different utilities and state programs across the country delivered ENERGY STAR for Homes programs. The manufactured housing program also experienced tremendous growth in 2006, selling 5,000 units nationwide, a 40 percent increase over 2005.

Updated Specification for ENERGY STAR Qualified Homes. EPA continued to work with its home builder partners and energy raters to transition to the new specification for ENERGY STAR qualified homes announced in 2005. By the middle of 2007, all new ENERGY STAR qualified homes will be constructed to the new specification. The new specification requires ENERGY STAR qualified appliances and lighting, proper installation of insulation, a tighter envelope, and more efficient delivery of conditioned air throughout the house. EPA estimates that the new specification will create homes that are 20 to 30 percent more energy efficient than homes built to the IRC 2004 energy code and homes that are at least 15 percent more stringent than a state's building code.

New Homes Outreach Partnership. Through the ENERGY STAR for New Homes Outreach Partnership, partners pool resources to increase consumer demand for ENERGY STAR qualified homes in their local markets. The Outreach Partnership provides a sustained local presence for ENERGY STAR and helps build consumer awareness of qualified homes and the builders who offer them. In 2006, the number of markets participating in the Outreach Partnership increased from 20 to 26.

Green Building Programs. ENERGY STAR continues to be the first step to "green," serving as a requirement for the Leadership in Energy and Environmental Design (LEED) for Homes certification. LEED for Homes also incorporated EPA's Indoor Air Package specifications and the ENERGY STAR Advanced Lighting Package into the point system used to qualify homes as LEED certified.

Affordable Housing. In 2006, EPA began working with Housing Finance Agencies (HFAs) to incorporate energy efficiency criteria in their Low Income Housing Tax Credit Program requirements. As a result, for the 2007 funding cycle, 29 states began awarding points to applications that incorporate ENERGY STAR qualified products, such as lighting, appliances, windows, and HVAC equipment, and/or ENERGY STAR construction guidelines for new homes. Ten states specifically cite construction guidelines for ENERGY STAR qualified homes.

What Makes an ENERGY STAR Home?

In all 50 states and the District of Columbia, almost 725,000 ENERGY STAR qualified homes are saving homeowners more than $170 million annually, while improving comfort, durability, and indoor air quality and protecting the environment. To earn the ENERGY STAR, a home must be independently verified to meet EPA's strict guidelines for energy efficiency. These homes are at least 15% more energy efficient than homes built to the 2004 International Residential Code (IRC), and include additional energy-saving features that typically make them 20–30% more efficient than standard homes. Any home three stories or less can earn the ENERGY STAR label, including single-family, attached, low-rise multi-family, and manufactured homes.

ENERGY STAR QUALIFIED HOMES CAN INCLUDE A VARIETY OF 'TRIED-AND-TRUE' ENERGY-EFFICIENT FEATURES:

- tight construction and ducts
- effective insulation systems
- efficient heating and cooling equipment
- high-performance windows
- efficient lighting and appliances

FIGURE 12. TOTAL ENERGY STAR QUALIFIED NEW HOMES DOUBLED IN PAST 2 YEARS

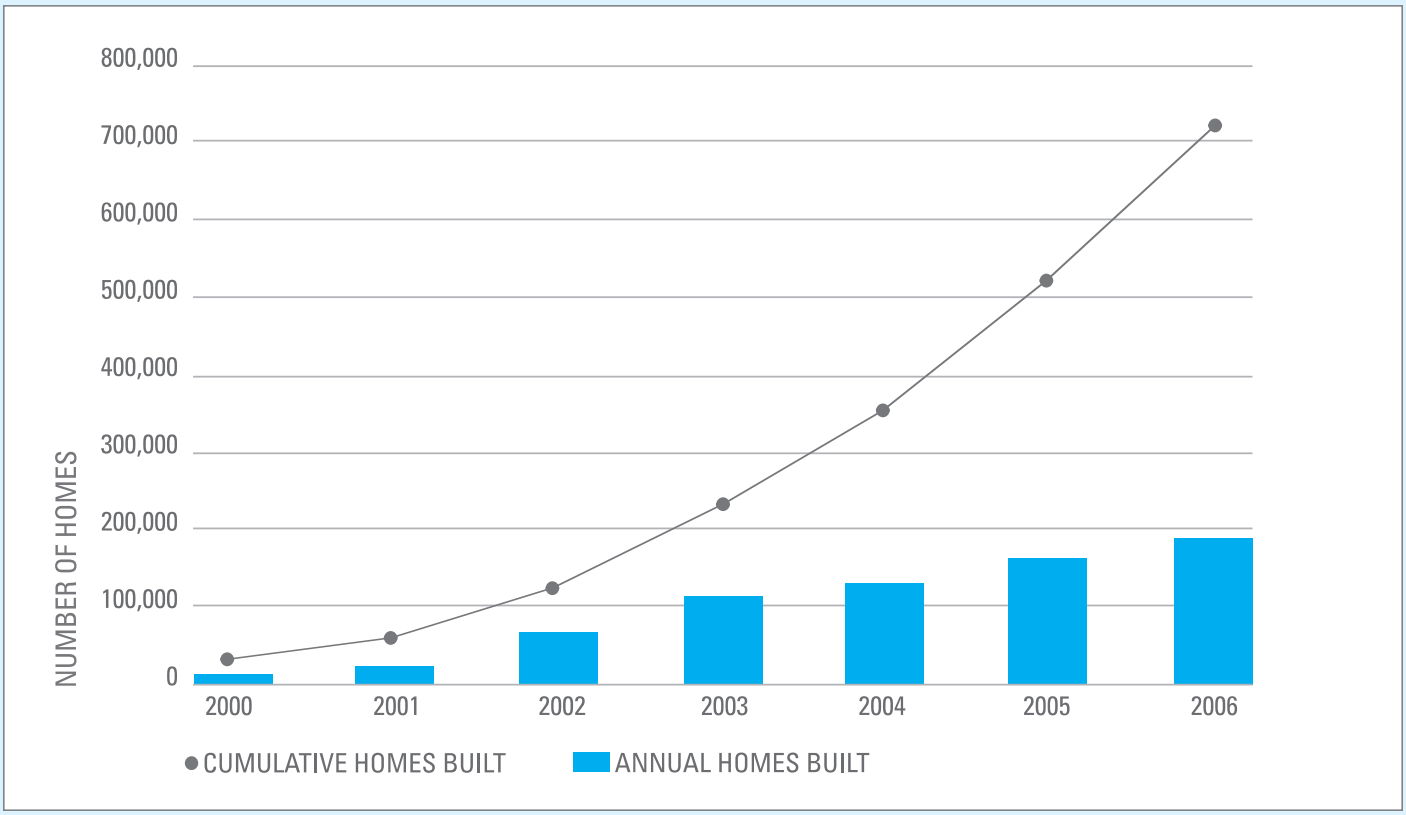
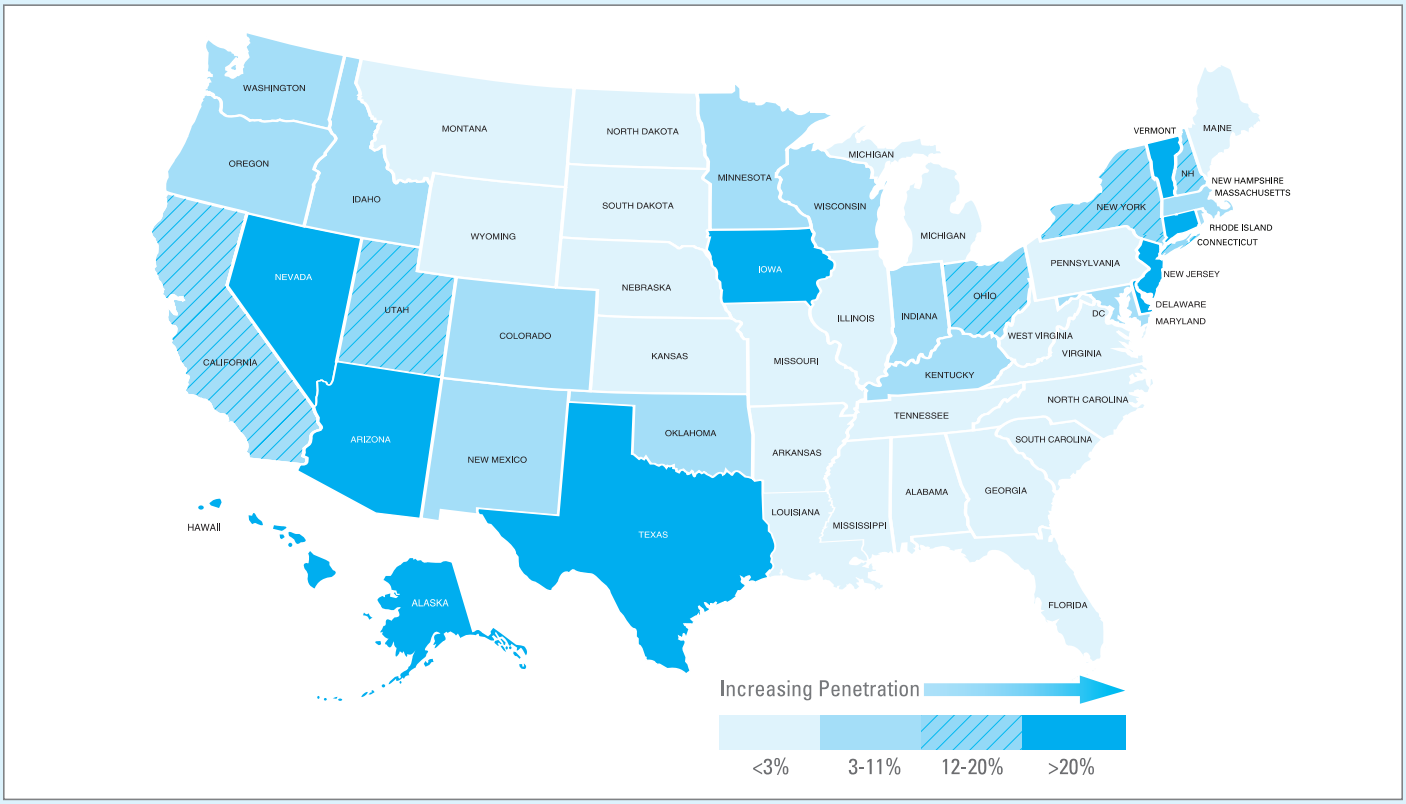


FIGURE 13. ENERGY STAR QUALIFIED NEW HOMES GAINING MARKET SHARE



Recognition for Outstanding Builder Partners. In 2006, EPA recognized five builders for sustained excellence: Astoria Homes, David Powers Homes, Ence Homes, Veridian Homes, and the Nevada ENERGY STAR Partners, all of whom have delivered high performing homes to their customers year after year. In addition, EPA recognized seven other builders as ENERGY STAR Partners of the Year: Anderson Homes, Inc., Bob Ward Companies, Bosgraff Homes, Haven Properties, Holton Homes, K.Hovnanian Homes-Minnesota Division, and Winton/Flair Custom Homes (see p. 27). EPA also honored three manufactured housing companies as ENERGY STAR Partners of the Year: CMH Manufacturing, Inc., The Commodore Corporation, and Palm Harbor Homes.

What to Expect in 2007 and Beyond

- EPA will finalize a new specification for digital-to-analog adapters (DTAs). In addition, EPA will complete specification revisions for TVs, roofing products, programmable thermostats, residential light fixtures, and furnaces. EPA also will initiate revisions for external power supplies and computer monitors. EPA will continue to expand the ENERGY STAR label to new product categories where the core program principles for cost-effectiveness and maintenance of product performance can be met and will revise the requirements for product categories already in the program as conditions warrant.
- EPA will also continue to work with its vast partnership network to help consumers and businesses, both large and small, choose ENERGY STAR qualified products with an emphasis on lighting products, small household appliances, commercial food service, office equipment, and heating and cooling products. Overall, EPA expects more than 300 million ENERGY STAR qualified products to be sold each year for the foreseeable future.
- EPA expects five new local Home Performance with ENERGY STAR programs to debut in 2007 and for that start-up rate to continue into the future. EPA also expects the program will complete an additional 20,000 retrofits by the end of 2007. This will grow to 100,000 over the next 5 years.
- In preparation for the ENERGY STAR HVAC Quality Installation program's nationwide launch in 2008, EPA will partner with ONCOR and Southern California Edison to conduct pilot programs in 2007 and will work with HVAC industry stakeholders to develop proper installation verification protocols for rigorous quality.
- EPA projects that builders will construct close to 130,000 ENERGY STAR qualified homes in 2007. This estimate accounts for not only the slowdown in the new homes construction market, but also the application of the more stringent ENERGY STAR specification by builders.
- EPA will roll out a pilot program to qualify and label multi-family high-rise buildings as ENERGY STAR. The pilots are designed to help EPA develop a comprehensive program that addresses the needs of the multi-family sector and improves the energy efficiency of all residential buildings with four or more floors and five or more units.
- EPA will continue to promote the ENERGY STAR message to builders, home energy raters, new home buyers, and utility partners. EPA intends to expand its builder outreach partnership to new markets, revamp its builder outreach toolkit, and hold utility and builder partner meetings to share best practices and promote solutions through ENERGY STAR.
- EPA will also be working to maintain the integrity of the ENERGY STAR label as required under the Energy Policy Act of 2005. EPA will routinely check for misuse of the ENERGY STAR label through a variety of mechanisms and address any misuse that is found. EPA will also communicate the procedures that it has in place to interested parties.

SUSTAINED EXCELLENCE AWARD

VERIDIAN HOMES *Madison, Wisconsin*

Veridian Homes, winner of the ENERGY STAR Award for the fourth time, was recognized for its continued outstanding commitment to delivering and promoting ENERGY STAR qualified homes in Wisconsin. The company promotes ENERGY STAR throughout the state by sponsoring conferences on energy savings and conservation, such as the Better Buildings: Better Business conference coordinated by the Energy Center of Wisconsin. Being energy efficient is part of Veridian's vision and mission statement. In a recent customer survey, 77% of people said energy efficiency was an important factor in selecting Veridian as their homebuilder. The company is committed to building 100% of its homes to ENERGY STAR standards. In 2006, it built 450 ENERGY STAR homes, bringing the company total to 2,480. Veridian uses the ENERGY STAR logo in all print ads, brochures, billboards, direct mail, radio ads, on its Web site, and in its model homes. This year it kicked off a new ENERGY STAR campaign, "Are You Seeing Stars?" to promote awareness and consumer recognition. The campaign was supported by print ads, a new brochure, a billboard, a flash module on the Web site, window decals for every Veridian home, pins for the sales team, and energy-related gifts at each furnished model.

PARTNER OF THE YEAR—NEW HOMES

BOSGRAAF HOMES *Holland Michigan*

Bosgraaf Homes, a family-owned business in western Michigan, has been a 100% ENERGY STAR partner since 1999. In 2006, Bosgraaf built its 1,000th ENERGY STAR home, which it promoted by sending "virtual groundbreaking" kits to news media as well as community and industry leaders in western Michigan. When the home was completed, Bosgraaf hosted an open house during the 12th Annual Fall Parade of Homes that included a scavenger hunt, media coverage, and free compact fluorescent light bulbs (CFLs) for the first 1,000 visitors. Bosgraaf has incorporated the ENERGY STAR mark and messaging into many aspects of its marketing and sales, including radio and newspaper ads, its Web site, and special public relations campaigns. The company also participated in Home Expo 2006, which promoted energy efficiency. In late 2006, Bosgraaf ran an inventory reduction sale, with reductions representing between 1,000 days and 1,000 weeks of free energy. Bosgraaf offers the ENERGY STAR Advanced Lighting Package as an option to buyers as well as ENERGY STAR qualified lighting fixtures and bulbs, HVAC equipment, windows, and appliances.

ADVANCED ENERGY *Raleigh, North Carolina*

Advanced Energy is a 501(c)(3) nonprofit energy services provider and ENERGY STAR partner in North Carolina that promotes energy efficiency and alternative energy resources. In 2006, it helped 50 nonprofit homebuilders in 40 counties construct more than 300 ENERGY STAR qualified homes that serve families earning 80% or less than the area median income. Advanced Energy has partnered with the North Carolina Housing Finance Authority to bring ENERGY STAR to all new supportive housing and Low Income Housing Tax Credit housing, providing a good example of how local energy groups can provide real solutions and a practical means for housing authorities to implement their energy priorities. The company has also worked with dozens of Habitat for Humanity chapters and community development corporations to change their production processes to incorporate ENERGY STAR guidelines. It is currently working on developing a pilot program to offer Home Performance with ENERGY STAR to the existing affordable housing stock.

Highlights of more 2006 Award winners may be found at energystar.gov/awards.

ENERGY STAR IN THE COMMERCIAL SECTOR

In 2006, increasing energy costs and greater awareness of the environmental impact of energy use in commercial buildings—which are more than 14 percent of U.S. CO_2 emissions—brought renewed attention to energy management from businesses and organizations across the country. Through the ENERGY STAR program, EPA continued to promote superior corporate energy management approaches and provide its commercial partners of all sizes objective guidance on assessing current energy use and developing action plans that will lead to significant energy reductions. Through strategic alliances with states, associations, and others, energy solutions were disseminated to more building owners than ever before. The result was record growth in the number of buildings rated, a larger number of organizations showing savings across their portfolios, and more businesses expanding their customer base for energy billing and management services to include ENERGY STAR and benchmarking.

Achievements in 2006

Commitment to Superior Energy Management. In 2006, many diverse organizations joined with ENERGY STAR to improve their efficiency. For example:

- More than 1,600 commercial, public, and industrial organizations have committed to adopting superior energy management approaches—with school districts again representing the largest number of new partners for the year. These ENERGY STAR partners own or operate about 11 billion square feet of building space across the country and approximately 16 percent of the commercial building market.
- More than 1,000 Service and Product Providers (SPPs) and nearly 75 utilities or other energy efficiency program administrators offer their clients and customers valuable energy efficiency services that incorporate ENERGY STAR tools and resources.
- More than 1,800 small businesses and congregations now participate in the ENERGY STAR network.

Challenging Building Owners to Reduce Energy Use. In its second year, the ENERGY STAR Challenge gained momentum as state governments and leading associations continued to reach out to their constituents and members to promote energy efficiency in buildings. About 30 states and more than 25 associations representing commercial real estate, health care, K-12 schools, and energy service sectors have joined in. The Challenge encourages commercial building owners, managers, and others to reduce energy use by 10 percent or more, which can save about $10 billion in energy costs across the nation's buildings. Highlights include:

- BOMA (the Building Owners and Managers Association International)—whose members represent approximately 75 percent of office space across the country—increased the presence of ENERGY STAR in the real estate market through a new energy efficiency training program that reached nearly 5,000 real estate professionals. The "Building Upgrade Value Calculator," developed in conjunction with EPA, helped property professionals assess the financial value of investments in a property's energy performance.
- ASHE (American Society for Healthcare Engineering of the American Hospital Association), the 12,000 member professional association of hospital and facility managers and engineers launched its Energy Efficiency Commitment (E2C) initiative to promote greater efficiency in health care facilities through ENERGY STAR.
- The efforts of the 10 leading associations representing state school boards, superintendents, principals, facility planners, parents, and teachers were reflected in substantial increases in the number of schools that have been rated for energy performance and recognized for leadership. Of the new ENERGY STAR Leaders in 2006, 75 percent were K-12 school districts. To date, more school buildings have been rated than any other type of building.

FIGURE 14. BUILDING RATING AND ENERGY STAR BUILDING LABELING GAIN MOMENTUM

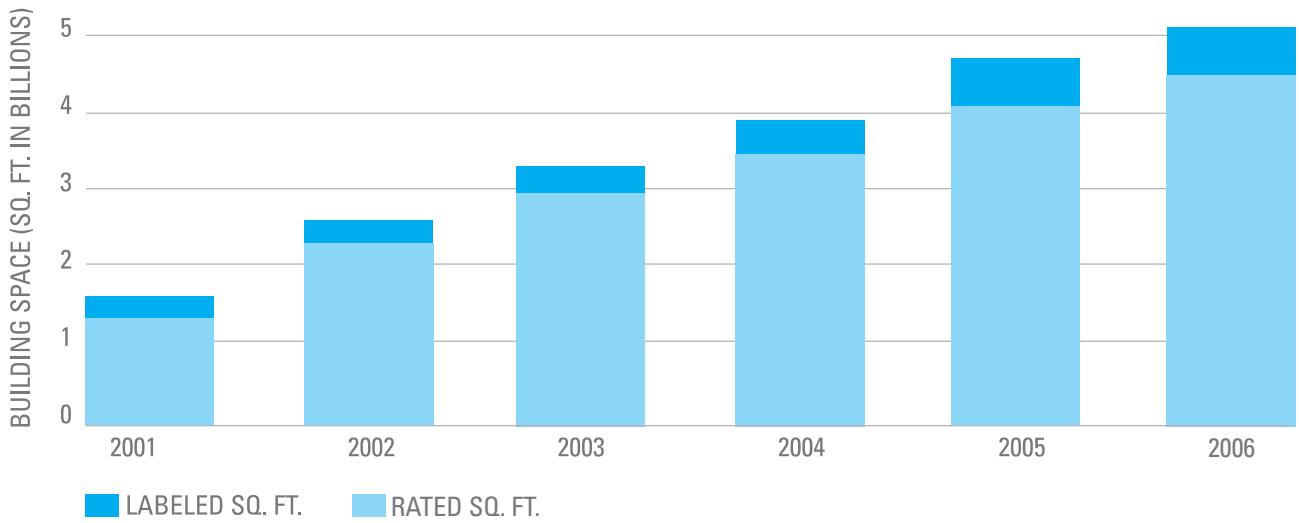
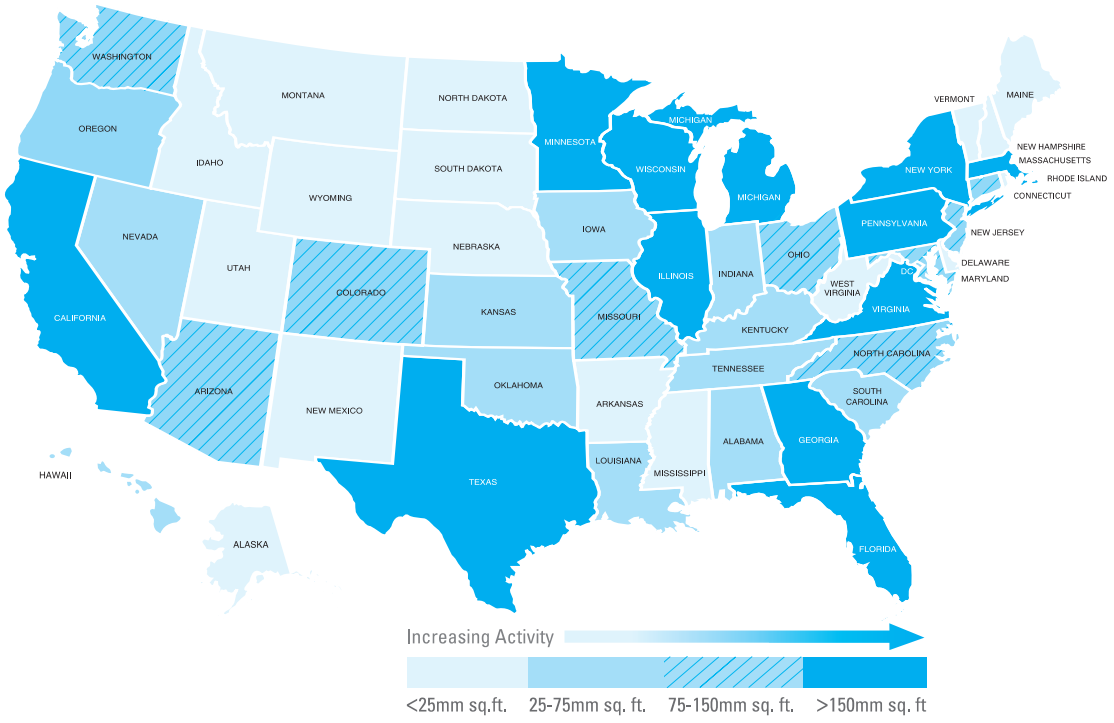


FIGURE 15. BUILDING RATING ACTIVITY BY STATE



- A growing number of states are requiring ENERGY STAR benchmarking as part of legislative requirements and executive orders designed to reduce the energy bills of public buildings. For example, the California Department of General Services is using ENERGY STAR benchmarking for the state's 250 largest buildings in response to the Governor's Green Building Initiative Executive Order. This is the first stage in benchmarking more than 1,600 state buildings and campuses. Texas has implemented an innovative business arrangement to provide energy management services and energy performance ratings to more than 7,000 government buildings.

Recognizing Outstanding Leadership. Recognizing excellence in energy management is a critical component of ENERGY STAR in the commercial sector. EPA recognizes leadership in two ways:

- EPA honored 12 organizations as ENERGY STAR Partner of the Year for Energy Management and Service and Product Provider. An additional 11 organizations were recognized for sustained excellence, reflecting their outstanding commitment to strategic energy management (see p. 33).
- EPA recognized 40 organizations nationwide as ENERGY STAR Leaders. They achieved continuous improvement of 10, 20, or 30 percent across their portfolios or an average portfolio-wide rating of 75 or better. These organizations represent more than 3,800 buildings and manage over 200 million square feet of building space across the country.

Rising Use of Energy Performance Ratings. More buildings than ever have now been rated for energy efficiency, an important step in targeting energy efficiency improvements (see Figure 14, p. 29). Since its release in 1999, EPA's energy performance rating system has scored the energy use of individual commercial buildings on a scale of 1 to 100 compared to the national stock of similar buildings. The system allows building owners to track energy performance over time and target investments in energy efficiency. 2006 highlights include:

- More than 30,000 buildings—representing over 5 billion square feet—have been rated to date nationwide (see Figure 15, p. 29), including 42% of hospital space, 30% of supermarket space, 25% of office building space, 18% of school space, and 17% of hotel space (see Figure 16).
- ENERGY STAR Exchange Service (ESES) grew 80 percent in 2006. ESES is an automated tool that facilitates rating through third-party servers, which makes energy rating easier for owners of large building portfolios. Ten energy service companies are now providing automated services to customers such as Accor Hotels, Food Lion, Giant Eagle, Marriott, and Providence Health Care.
- The California Benchmarking Work Group joined EPA, the state, investor-owned utilities, and municipal utilities to enhance EPA's automated energy data transfer capabilities and allow utilities to directly upload energy data into Portfolio Manager accounts. This will speed the benchmarking of thousands of buildings in California and across the country.
- EPA added the ability to track water use—another important measure of efficient management and environmental performance—to Portfolio Manager.

Recognizing Top Performing Buildings. Businesses and public institutions that achieve a score of 75 or above in EPA's energy performance rating system and meet industry standards for indoor air quality can earn the ENERGY STAR for superior energy performance. Labeled buildings consume about 35 percent less energy than typical buildings, while providing comparable comfort and services. About 400 of the ENERGY STAR buildings use 50 percent less energy than average buildings. By the end of 2006:

- More than 3,200 highly efficient buildings had earned the ENERGY STAR for reducing their energy use and greenhouse gas emissions (see Figure 17). Representing almost 575 million square feet, the buildings save an estimated $600 million annually on their energy bills, relative to average buildings.
- ENERGY STAR labeled buildings included more than 1,140 office buildings, 1,130 supermarkets, and 650 schools. More than 300 banks, courthouses, financial centers, hospitals, hotels, medical offices, and—for the first time—residence halls also earned the ENERGY STAR.

FIGURE 16. CUMULATIVE BUILDINGS RATED BY TYPE

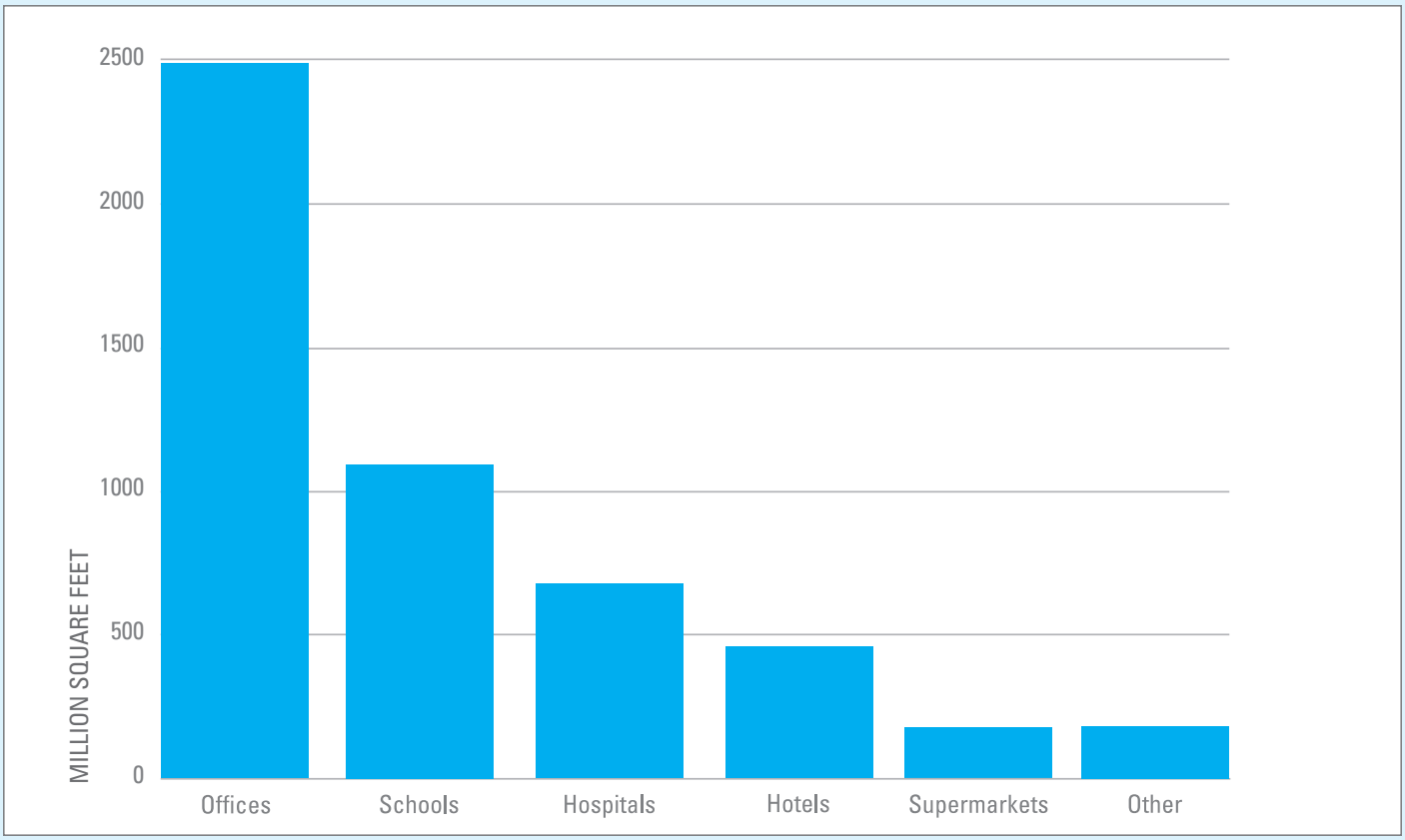
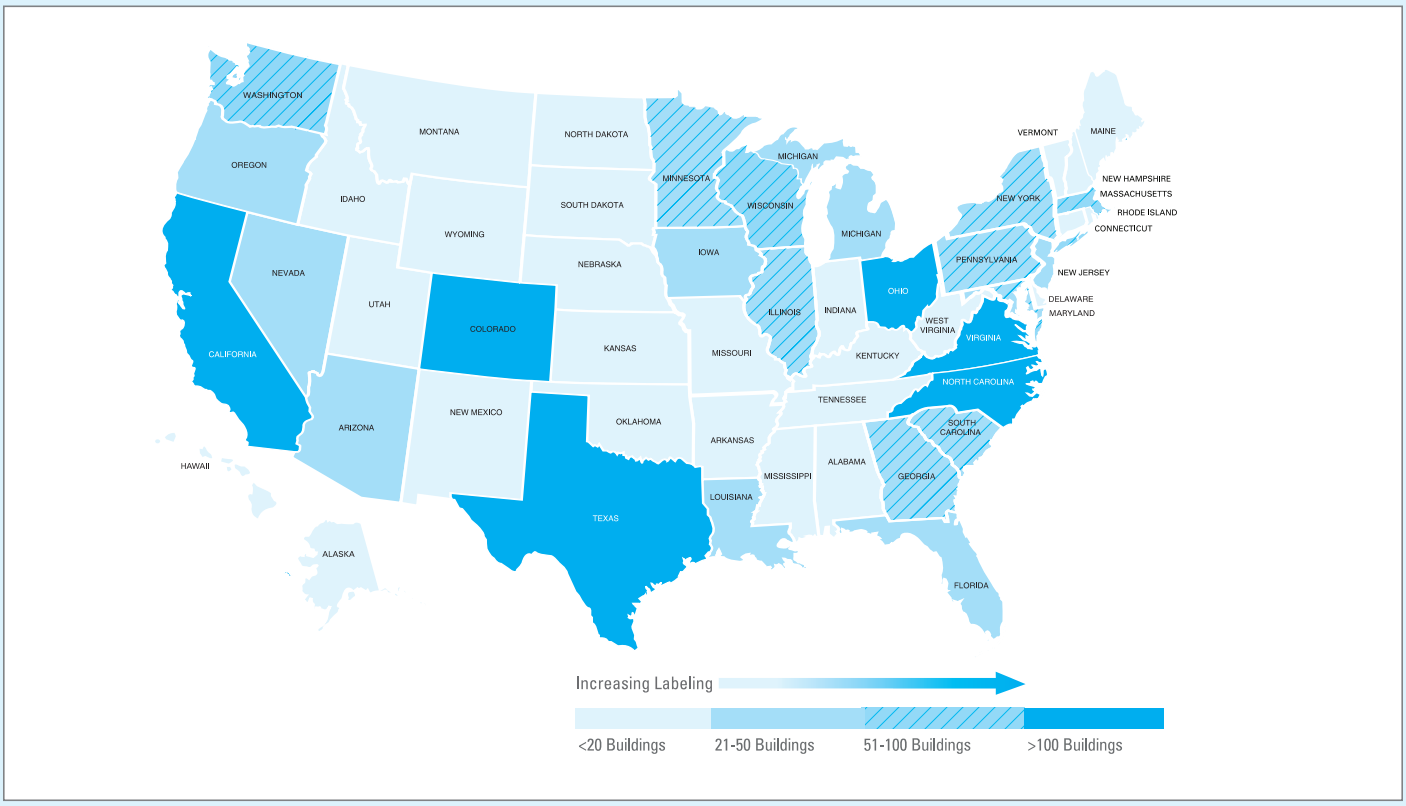


FIGURE 17. MORE THAN 3,200 BUILDINGS HAVE EARNED THE ENERGY STAR LABEL



Assistance with Performance Rating. In 2006, EPA continued to partner with organizations such as energy service providers, utilities, state energy groups, and administrators of public benefits funds to provide guidance to energy end-users about opportunities for improving energy performance and training to service providers on offering the performance rating service. In 2006:

- California's largest investor-owned utilities, Pacific Gas & Electric, San Diego Gas & Electric, and Southern California Edison, integrated the EPA energy performance rating system into their new retro-commissioning programs to engage customers, measure baseline energy use, and track results.
- Other utilities and program implementers, such as the Energy Trust of Oregon, Mid-American Energy, New York State Energy Research and Development Authority (NYSERDA), Wisconsin Focus on Energy, and Xcel Energy, also integrated the EPA performance rating into their building performance initiatives.
- EPA and the National Association of Energy Service Companies (NAESCO) hosted networking seminars for nearly 300 energy service professionals to promote and educate ESCOs on ENERGY STAR. Additional regional networking meetings were held to bring SPPs together with end-users in order to build demand for energy efficiency related services and products. Training was provided on performance rating and other energy efficiency topics. Results include SPPs assisting their clients in achieving EPA recognition and helping to rate the performance of more than 7,000 buildings in 2006.

Enabling Small Businesses to Save Energy. More small businesses and faith-based organizations are taking the opportunity to reduce energy use cost-effectively through ENERGY STAR guidance (see p. 35). In addition to 1,800 small organizations joining the ENERGY STAR network, many are finding assistance online, as their visits to the small business portion of the ENERGY STAR Web site numbered over 11,000 per month, the most activity for any sector.

Efficient Commercial Products. In addition to offering proven strategies for superior energy management, EPA promotes a number of efficient commercial products used throughout the public and private sectors. In 2006, EPA revised the specifications for ENERGY STAR qualified computer and imaging equipment—which for the first time address active power (see p. 34)—and vending machines. EPA also initiated development of new specifications for commercial food service equipment such as dishwashers and icemakers, to help round out a full suite of commercial kitchen products (see Table 12, p. 35).

Energy Efficiency is the First Step to Green. EPA promotes energy efficiency as both a stand-alone goal and a critical element of green buildings. In 2006, EPA worked collaboratively with leading designers, states, federal agencies, the American Institute of Architects (AIA), and green building rating organizations to develop green building policies that effectively promote energy efficiency and reflect the financial savings buildings can offer when well-designed. Highlights include:

- EPA challenged architects to achieve the American Institute of Architects 50 percent fossil fuel reduction goal using EPA's energy performance targets.
- About 90 architecture and engineering (A&E) firms partnered with EPA and became eligible to use the "Designed to Earn the ENERGY STAR" graphic on project drawings when the project meets EPA energy performance criteria.
- About 1,900 professionals in the A&E community were trained on the importance of setting energy targets during the design phase and checking their design's estimated energy use against these targets as projects mature.
- Seven states and the District of Columbia now include ENERGY STAR in their legislative or other efforts focused on energy efficiency or green buildings.
- The White House Summit on Federal Sustainable Buildings agreement outlines guiding principles of design, energy performance, water conservation, indoor air quality, and sustainable materials that should be used in federal facilities. It includes establishing energy performance targets and verification of those targets using EPA's energy performance rating system.

SUSTAINED EXCELLENCE AWARD

USAA REAL ESTATE COMPANY *San Antonio, Texas*

USAA Real Estate Company, which owns and manages more than 22 million square feet of real estate, was recognized as an ENERGY STAR Award winner for the fifth consecutive year. Through its long-term commitment to continuous improvement in energy performance, USAA is reaping benefits year after year. In 2006, USAA focused on operational and management practices, low-cost improvements, and better communications. These efforts reduced energy consumption by more than 6% across the portfolio in 2006, for a total savings of nearly 23% over the past 6 years. The company has attained the prestigious ENERGY STAR Leaders recognition for the third straight year for an average portfolio rating above 75. USAA estimates that it has increased the asset value of its portfolio by more than $30 million and prevented 89 million pounds of carbon dioxide from entering the atmosphere. USAA's senior management continues to demonstrate its commitment to promoting industry change by sharing real estate best practices, designing and implementing industry association-based market transformation programs, and communicating the value of energy efficiency to internal and external stakeholders.

PARTNER OF THE YEAR—ENERGY MANAGEMENT

DAVENPORT COMMUNITY SCHOOL DISTRICT *Davenport, Iowa*

With 35 separate sites serving nearly 16,000 K–12 students in four communities, the Davenport Community School District is the third largest school district in Iowa. An ENERGY STAR partner since 1998, the district has assessed the energy performance of 100% of its schools, undertaken improvements, elevated the average rating across the portfolio by 10%, and achieved a portfolio-wide average rating of 75 or better. The benefits of the district's energy program include reducing costs per student to $88.46 per school year (compared to the national average of $181.53 per student in 2004–2005) and realizing energy savings of more than $1 million over 3 years. The success starts with leadership at the top—the superintendent and school board. It also includes school principals, custodians, administrators, teachers, and students. The district's energy program concentrates on typical investments in building systems, but it also believes that a very strong component of responsible energy use is changing behavior. By participating in activities such as the ENERGY STAR *Change a Light, Change the World* campaign and awarding high-performing schools ENERGY STAR qualified computers, the district believes that modeling responsible energy efficiency to students will help bring a better environment for future generations.

J.C. PENNEY COMPANY, INC. *Plano, Texas*

J.C. Penney, has made a long-term commitment to its Energy Conservation Culture, demonstrated by its investments in efficiency upgrades and expansion of the company's Energy Team. In 2006, J.C. Penney reduced energy use by 1.4 to 3% across its operations, while expanding store hours and opening 28 new stores. The company participated in the 2006 ENERGY STAR *Change a Light, Change the World* campaign and is helping its 150,000 associates participate in the 2007 campaign. As a leading participant in the ENERGY STAR Retail Networking Group, J.C. Penney has exchanged best energy management practices with other retailers and helped develop and test the upcoming ENERGY STAR rating for retail benchmarking.

SHRINERS HOSPITALS FOR CHILDREN *Houston, Texas*

The Houston Shriners Hospital is a 40-bed pediatric hospital providing comprehensive orthopedic care to children at no cost. Shriners' CEO in Houston recognizes that every dollar saved enables the hospital to treat a greater number of children, purchase new medical technology, and fund more research. Shriners-Houston joined ENERGY STAR in 2003 after learning its energy performance was less than the industry average. The director of engineering and maintenance created an internal energy team with one goal: to achieve the ENERGY STAR for the facility utilizing in-house labor and without increasing the operations budget. The hospital succeeded dramatically, earning the ENERGY STAR label 4 years in a row and raising its energy performance rating by 49 points. In 2006, the hospital continued lighting retrofits, installed occupancy sensors and high efficiency motors, replaced inefficient computers, improved operations, and saved another $21,500 in energy costs. Its performance rating climbed to 91. Shriners-Houston shares best practices through association conferences, newsletters, local magazines, and industry trade publications.

Highlights of more 2006 Award winners may be found at energystar.gov/awards.

What to Expect in 2007 and Beyond

EPA will continue to work with its commercial sector partners to promote energy management and improvements in building energy use. Specifically, EPA will:

- Expand the reach of the ENERGY STAR Challenge by working with a number of key public and private organizations, such as the U.S. Conference of Mayors, National Association of Auto Dealers, and American Bar Association, and continue to work with existing Challenge participants in outreach around the Challenge.
- Refine EPA's energy performance rating system by releasing a new retail and a revised office model, as well as expanding ENERGY STAR Leaders to include non-ratable spaces, starting with those owned by local governments. EPA will also expand automated benchmarking services and enable large-scale benchmarking of hundreds of publicly-owned facilities in Ohio, Minnesota, and other states.
- Collaborate with the CoStar Group—the nation's largest multiple listing service for the sale and lease of commercial properties with over 2 million properties in its database—as it launches an initiative to help clients identify properties that have earned the ENERGY STAR.
- Continue to integrate EPA's energy performance rating system and other ENERGY STAR tools and resources into the energy efficiency programs of utilities and other regional program initiatives.
- Enhance the tools supporting the ENERGY STAR Challenge by developing a "Next Steps" technical guidance; completing an update to EPA's *Building Upgrade Manual*; and finalizing a retro-commissioning guide.
- Expand collaboration with the 2030 Challenge and AIA and ensure the ENERGY STAR tools complement their efforts.
- Finalize new or revised product specifications for ENERGY STAR qualified commercial dishwashers, commercial icemakers, and roofing products. EPA will also initiate specification revisions for servers, computer monitors, and commercial solid door refrigerators and freezers.
- Work with EPA's Office of Water to develop and implement water tracking, benchmarking, and improvement.
- Recognize organizations that practice superior energy management through Partner of the Year and ENERGY STAR Leaders.

Making Offices More Efficient: ENERGY STAR Computers and Imaging Equipment

In 2006, EPA finalized revised specifications for ENERGY STAR qualified computers and imaging equipment. Computers, which were the first product category eligible to earn the ENERGY STAR label, use nearly 58 billion kWh annually, or about 2% of total U.S. electricity consumption. Computers earning the label will be 20-50% more efficient than standard models and will include desktop and notebook computers, game consoles, integrated computer systems, desktop-derived servers, and workstations. Over the next 5 years, these products will save consumers and businesses about $1.8 billion and avoid greenhouse gas emissions equivalent to those from 2.7 million vehicles. The updated imaging specification is expected to bring even greater savings to Americans: $3 billion and GHG emissions equivalent to more than 4 million vehicles. Products bearing the label under the updated specification—including printers, fax machines, multi-function devices, scanners, and mail machines—will use approximately 25% less energy. Currently, the 260 million pieces of imaging equipment in use nationwide consume approximately 3% of U.S. electricity demand and $7.5 billion in energy costs.

EPA RECOGNIZES SMALL BUSINESSES

By the end of 2006, more than 1,800 small businesses and congregations were partnering with EPA through the ENERGY STAR program. By using ENERGY STAR tools to improve their energy efficiency, these organizations are leading their communities in environmental stewardship while reducing energy costs. In 2006, EPA honored 11 small businesses and congregations from across the country as part of the ENERGY STAR Small Business and Congregation awards.

THE 2006 ENERGY STAR SMALL BUSINESS WINNERS

Basil Bandwagon Natural Market and Basil Brook Organic Farm
Flemington, NJ

Gehman & Company
Mechanicsburg, PA

Myobz LLC
Carlsbad, CA

RBR-Recumbent Bike Riders, Inc.
State College, PA

Susquehanna Fire Equipment Co.
Dewart, PA

The Music Mart, Inc.
State College, PA

T.J.'s Market
Hughesville, PA

Tripps Grill and Six Pack
North Bend, PA

2006 ENERGY STAR CONGREGATION WINNERS

Keystone Community Church
Ada, MI

San Francisco Zen Center
San Francisco, CA

2006 SPECIAL AWARD

Michigan Interfaith Power and Light
East Lansing, MI

TABLE 12. ENERGY STAR COMMERCIAL PRODUCT SPECIFICATIONS ADDED, REVISED, AND IN PROGRESS

PRODUCT CATEGORY	YEAR INTRODUCED AND (YEAR REVISED)	AGENCY RESPONSIBLE	STATUS OF ACTIVITY IN 2006
Commercial Dishwashers		EPA	New specification initiated in 2006.
Commercial Icemakers		EPA	New specification initiated in 2006.
Computers	1992 (2006)	EPA	Revision completed. Revised specification to take effect in 2007.
Imaging Equipment	1993 (1994, 1995, 1997, 2006)	EPA	Revision completed. Revised specification to take effect in 2007.
Roofing	1999	EPA	In progress.
Vending Machines	2004 (2006)	EPA	Revision completed. Revised specification to take effect in 2007.

PARTNER OF THE YEAR—PRODUCT MANUFACTURER

AGA FOODSERVICE EQUIPMENT *Cherry Hill, New Jersey*

AGA FOODSERVICE EQUIPMENT

AGA Foodservice Equipment's component companies and parent organization are committed to building products that are category leaders in efficiency. AGA companies produce commercial kitchen equipment with advanced design and technology that reduce energy, water, and oil consumption. The flagship company, Victory Refrigeration, is the leader in ENERGY STAR commercial refrigerators and freezers, with more than 420 qualified models. AGA's companies promote ENERGY STAR to customers, restaurant designers, and others through conferences, training, trade shows, and educational presentations.

Highlights of more 2006 Award winners may be found at energystar.gov/awards.

ENERGY STAR IN THE INDUSTRIAL SECTOR

Higher energy prices and concerns about global warming have bolstered EPA's industrial program efforts and helped EPA engage more sectors and new participants. These industries look to ENERGY STAR as they search for ways to strategically manage energy, improve overall energy efficiency, and earn distinction as environmental stewards. EPA's guidelines for energy management, energy performance measurement tools, and peer exchange networks enable manufacturers to measure, monitor, manage, and continuously improve their energy use while working to minimize their energy risks.

Achievements in 2006

Industrial Focuses Boost Energy Savings. While many of the energy and environmental issues facing manufacturers are similar, every individual industrial sector has its own barriers to energy efficiency. To address those unique challenges, EPA collaborates with its partners to develop tailored Industrial Focuses. For each focus industry, EPA, along with its industry partners, develops plant-level energy performance indicators (EPIs), provides peer exchange opportunities, and publishes guidance on overcoming sector-specific barriers to energy efficiency. As of 2006, 10 industries were actively engaged with EPA in these Industrial Focuses (see Table 13). Highlights of 2006 include:

- Adding two new focus industries—petrochemicals and pulp and paper—creating peer exchange networks, and initiating studies of energy performance measurement tools and industry-specific best practices.
- Advancing current industry focus partnerships with automobile manufacturing, cement, corn refining, food processing, glass, pharmaceuticals, petroleum refining, and water/wastewater treatment industries.
- Releasing new EPIs for U.S. cement and corn refining plants and issuing three additional EPIs for glass and food processing plants for industry testing.
- Awarding the ENERGY STAR for the first time to 20 top performing manufacturing plants in the auto assembly, cement, and corn refining industries, where EPIs have been established (see Table 14, p. 39). The ENERGY STAR can be used on a plant banner or flag to recognize facilities whose energy performance is in the top 25 percent for that industry nationwide. Already it has been found to help stimulate improved energy performance across a company's entire set of plants.
- Expanding the suite of energy guides available to industrial partners by releasing final guides for the petroleum and pharmaceutical industries and draft energy guides for food processing and glass manufacturing.
- Sharing best practices across the ENERGY STAR focus industries at the annual meetings of relevant industries in concert with the Association of Energy Engineer's World Energy Engineering Congress.
- Developing draft guidance for facility-level benchmarking to facilitate this practice where EPIs have yet to be developed.

Broad Industrial Partnerships. EPA supports partners from a wide variety of industrial sectors beyond the focus industries. Energy management resources available for these partners include the core materials for effective energy management on the ENERGY STAR Web site, communication materials, an active network of energy managers, and recognition for superior energy management. In 2006:

- More than 450 partners, spanning a broad range of industrial sectors, used ENERGY STAR tools to improve their energy management.
- EPA released a new broadly applicable tool—the Facility Energy Program Assessment Matrix—to help companies large and small assess energy management practices at the plant and facility levels and bring better energy management practices to all those who have direct impact on energy use.
- EPA's peer exchange network grew by 8 percent. These 430 participants, representing nearly 175 organizations, discussed topics such as energy and greenhouse gas management, the value of sub-metering in controlling energy use, and common technologies for reducing energy use in facilities.
- ENERGY STAR partners worked with EPA to increase consumer awareness of the environmental benefits of energy-efficient lighting by encouraging employees to take the ENERGY STAR *Change a Light, Change the World* pledge. Several industrial partners were among the most active pledge drivers in the country.

TABLE 13. SUMMARY OF EPA ENERGY STAR INDUSTRIAL FOCUSES

FOCUS	YEARS ACTIVE	SCOPE	PEER EXCHANGE OPPORTUNITY	INDUSTRY ENERGY GUIDE	ENERGY PERFORMANCE INDICATOR
Cement Manufacturing	3	50 percent of U.S.-based clinker [1]* production capacity	•	Complete	Final
Corn Refining	4	95 percent of U.S.-based refining capacity	•	Complete	Final
Food Processing	1	80 percent of U.S. processed fruit, vegetable, and grain sales	•	In process	In process
Glass Manufacturing	1	50 percent of U.S. flat, container, and fiberglass sales	•	In process	In process
Motor Vehicle Manufacturing	5	75 percent of the industry with U.S.-based production	•	Complete	Final, updating
Petrochemical Manufacturing	New	83 percent of U.S. ethylene production capacity	•	In process	Exploring options
Petroleum Industry	2	64 percent of U.S.-based refining capacity	•	Complete	Private system recognized by EPA
Pharmaceuticals	2	Over 50 percent of the global and U.S. manufacturing capacity	•	Complete	In process
Pulp & Paper	New	70 percent of U.S.-based companies' global sales	•	In process	Exploring options
Water and Wastewater	1	40 percent of the total U.S. population represented	•	In process	In process

[1] Clinker is the output from a cement kiln.
**U.S. Census Bureau, December 2006 and 2005.*

PARTNERS OF THE YEAR—INDUSTRIAL SECTOR

PEPSICO *Purchase, New York*

PepsiCo has a corporate sustainability vision to continuously improve the world—with ENERGY STAR and energy management as key components. In 2006, PepsiCo expanded its awarding-winning energy program across all food and beverage manufacturing companies, reducing energy intensity by 6% and avoiding an estimated $14 million in utility costs. At the same time, PepsiCo encouraged its suppliers to establish energy goals and join the ENERGY STAR partnership. The company has been an active supporter and contributor to ENERGY STAR initiatives and the ENERGY STAR *Change a Light, Change the World* campaign. PepsiCo's energy savings represent the equivalent sales of 33 million bottles of Gatorade, 14 million boxes of cereal, or 25 million bags of Lay's potato chips.

MERCK & CO., INC. *Whitehouse Station, New Jersey*

At the start of 2006, Merck's three most senior executives issued a call to action for all employees to do their part in making the company the "most competitive energy steward in the pharmaceutical industry" by reducing energy use by 25% by 2008. Merck played a leading role in the ENERGY STAR Pharmaceutical Industrial Focus and through its Global Energy Team initiatives, it has set a strong example with a 9.4% decrease in energy intensity in 2006 alone. Merck also promotes ENERGY STAR to employees through energy efficiency education materials and shares best practices with other manufacturers.

Highlights of more 2006 Award winners may be found at energystar.gov/awards.

Recognizing Leadership in Industrial Energy Efficiency. EPA recognized three ENERGY STAR industrial partners with the honor of Sustained Excellence in Energy Management for 2006: 3M, Toyota Motor Manufacturing North America, and California Portland Cement Company (see p. 39). Sustained Excellence awardees continually challenge their organizations to improve energy efficiency and consistently achieve impressive results. Each organization has an advanced energy strategy that reaches beyond the company to impact energy upstream and downstream, and each firm annually achieves substantial energy savings. Four additional industrial partners were recognized as ENERGY STAR Partners of the Year in 2006 (see two examples, p. 37).

Financial Signals for Sound Energy Management. EPA worked with the financial sector to educate investors and analysts on the value of strong corporate energy management programs, the role of energy efficiency in corporate GHG management, and available resources for evaluating energy management practices and strategies. Highlights include:

- Collaborating with the Carbon Disclosure Project, Merrill Lynch, and major institutional investors to discuss best practices in evaluating voluntary efforts to reduce greenhouse gas emissions.
- A series of papers and articles on the role that EPA's climate protection programs play in helping leading companies reduce energy costs and greenhouse gas emissions.

EPA also collaborated with senior energy directors and managers from a variety of U.S. corporations to develop four scenarios of the world energy scene through the year 2020. These scenarios pose specific challenges to senior corporate executives as they seek to manage their companies successfully in the face of an uncertain future.

What to Expect in 2007 and Beyond

In the coming years, EPA will continue to partner with hundreds of new and existing industrial organizations to break down the market barriers that stifle energy efficiency.

EPA will:

- Continue the Industrial Focuses with the 10 participating sectors. EPA expects to finalize two industrial EPIs in 2007—for the freezing and canning of fruits and vegetables and the glass production industries—and issue an updated EPI for auto assembly.
- Progress in the development of EPIs for other sectors. EPA will also expand the scope of some of the Industrial Focuses, based on the sector's interests, to include additional energy efficiency opportunities. These expansions include looking beyond vehicle assembly operations with the vehicle manufacturers, developing a second EPI for the food industry for cereal production plants, and investigating the possibility of developing a third EPI for glass producers that will address glass fiber plants.
- Continue to support peer exchange forums for these industrial sectors as well as convene initial meetings as new Focuses are formed.
- Expand the system for labeling energy-efficient U.S.-based plants with the ENERGY STAR. EPA expects that plants engaged in freezing and/or canning fruits and vegetables and those that manufacture glass will be eligible to earn the ENERGY STAR by the end of 2007.
- Finalize and publish draft guidance for non-EPI industry facility benchmarking.
- Expand the capability of companies to benchmark or rate the energy performance of all types of facilities by producing a guide on how to more generally benchmark energy use, as a cornerstone to effective energy management.
- Continue to work with leading U.S. business executives to identify the advanced energy management strategies that can be used to manage energy effectively and competitively over the next decade.
- Continue to recognize excellence in industrial energy management through annual awards.

TABLE 14. EPA INTRODUCES THE ENERGY STAR LABEL FOR SUPERIOR ENERGY MANAGEMENT OF INDUSTRIAL PLANTS

AUTO ASSEMBLY
The Ford Motor Company assembly plant in Chicago, IL
The Ford Motor Company assembly plant in St. Paul, MN
The Ford Motor Company assembly plant in Claycomo, MO
The Ford Motor Company assembly plant in Norfolk, VA
The Nissan North America, Inc. assembly plant in Canton, MI
The Nissan North America, Inc. assembly plant in Smyrna, TN
The Toyota Motor Engineering & Manufacturing North America, Inc. car assembly plant (NUMMI passenger) in Fremont, CA
The Toyota Motor Engineering & Manufacturing North America, Inc. assembly plant (NUMMI truck) in Fremont, CA
The Toyota Motor Engineering & Manufacturing North America, Inc. assembly plant (TMMI East) in Princeton, IN
The Toyota Motor Engineering & Manufacturing North America, Inc. assembly plant (TMMI West) in Princeton, IN
The Toyota Motor Engineering & Manufacturing North America, Inc. assembly plant (TMMK Plant 1) in Georgetown, KY
The Toyota Motor Engineering & Manufacturing North America, Inc. assembly plant (TMMK Plant 2) in Georgetown, KY
CEMENT
The Ash Grove Cement Company plant in Chanute, KS
The Ash Grove Cement Company plant in Seattle, WA
The California Portland Cement Company plant in Colton, CA
The California Portland Cement Company plant in Mojave, CA
The Lafarge North America plant in Calera, AL
The Lafarge North America plant in Sugar Creek, MO
WET CORN MILLING
The Penford Products Company plant in Cedar Rapids, IA
The Tate and Lyle Ingredients Americas Inc. Sagamore plant in Lafayette, IN

SUSTAINED EXCELLENCE AWARD

CALIFORNIA PORTLAND CEMENT COMPANY
Glendora, CA

California Portland Cement Company (CPC) manufactures cement, concrete, concrete products, and aggregates and continues to be a strong proponent of energy efficiency in the cement and concrete manufacturing industries. The company instituted a corporate-wide energy program in 2003, which now includes investment in new energy-efficient plant technologies, wholesale employee energy education, and plant benchmarking of energy using the ENERGY STAR cement plant energy performance indicator. In 2006, two of its plants were among the first in the industry to earn the ENERGY STAR. And, California Portland Cement saved 224 billion Btus—equal to the energy used to power about 3,000 American homes.

Highlights of more 2006 Award winners may be found at energystar.gov/awards.

CPC's Mojave Plant was one of six U.S. cement plants to earn the ENERGY STAR label in 2006.

PROGRAM EVALUATION: MEASURING RESULTS IN THE ENERGY STAR PROGRAM

In 2006 alone, the ENERGY STAR program helped Americans save about $14 billion on their energy bills while avoiding more than 37 million metric tons of greenhouse gas emissions. However, these are only a small portion of the cumulative $150 billion and almost 500 million metric tons EPA estimates are currently attributable to ENERGY STAR programs between 1993 and 2016.[10] The methodologies used to derive these annual and cumulative benefits in this report are described below.

The cumulative estimated benefits reflect the stream of energy savings that will persist through 2016 due to technology investments and product purchases made by ENERGY STAR partners through 2006. The results for all programs address the potential for double-counting benefits between programs and do not include benefits potentially attributable to pre-existing trends or third-party promotion efforts.

PRODUCTS

- Sales of products due to the ENERGY STAR program are determined as those above and beyond established business-as-usual (BAU) purchases of these products.[11] These sales are estimated by:
  - Collecting annual sales data on ENERGY STAR qualifying products from participating product manufacturers as a condition of partnership and supplementing these data by industry reports on total annual product sales as necessary. These data are screened and issues resolved.
  - Using established BAU baselines for annual product sales for each product category. These baselines use historic data and expert judgment and typically reflect increasing market shares for efficient products and increasing product efficiencies over time.
- Annual energy savings are calculated using established values for the difference in annual energy use between a single ENERGY STAR product and a typically purchased product. For these values, EPA:
  - Assumes that ENERGY STAR products just meet the ENERGY STAR thresholds, even though there are some products that exceed this level.
  - Assumes the typically purchased product meets minimum efficiency standards where standards exist or uses the average energy use for the product category where there are no standards.
  - Supports primary data collection, such as product metering to collect power use information, where additional information is necessary to estimate energy savings.
  - Uses product specific lifetimes that vary from 4 to 20 years. While those who purchase an ENERGY STAR qualified product are likely to replace it with one, EPA includes only a fraction of replacement purchases and investments in the program benefits.
- Peak power savings are estimated using product-specific factors that reflect the contribution of the annual energy savings from a product to peak load savings.
- Net energy bill savings is the present value (PV) of energy bill savings minus the PV of any incremental cost of purchasing an ENERGY STAR product above a standard model over the product lifetimes discussed above.[12] All energy bill calculations use national sector-specific fuel prices.
- Avoided emissions of greenhouse gases for 2006 are determined using marginal emissions factors for CO_2 based on historical emissions data from EPA's eGRID database.[13] For future years, EPA uses factors derived from energy efficiency scenario runs of the integrated utility dispatch model, Integrated Planning Model (IPM®).[14]

[10] A full summary of the ENERGY STAR program's annual and cumulative financial and environmental benefits can be found in Table 1 on page 3 of this report.

[11] For more details on many aspects of this method, see Sanchez 2006 and Weber 2000.

[12] Calculated using a 7% discount rate and 2006 perspective.

[13] For more details on eGRID, see U.S. EPA, 2007a.

[14] For more details on IPM, see U.S. EPA, 2006.

[15] For more details on many aspects of the previous methods, see Horowitz, M.J., 2004 and 2001.

[16] For more details on many aspects of this method, see Horowitz, M.J., 2007a and 2007b.

[17] For more details on many aspects of this method, see Horowitz, M.J., 2007.

NEW HOMES

- EPA receives data quarterly from third-party verifiers (home energy raters) on the number of homes they verified to be ENERGY STAR, as a condition of program partnership. These raters abide by a set of quality assurance practices to ensure data quality. In addition, EPA reviews the submitted data and resolves any data irregularities.
- EPA recognizes that some new homes that qualify for ENERGY STAR are not a direct result of the program and that many homes built to ENERGY STAR levels due to the program are not labeled or reported to the program. Currently, EPA estimates the former number of homes to be lower than the latter.
- Annual energy savings are calculated using established values for the energy savings from a home that meets the ENERGY STAR level relative to a home built to code. Energy bill savings are calculated using a similar approach as for products and average national energy prices for the residential sector. The average lifetime of a home for both energy and billing savings is 30 years.
- Peak power savings and avoided emissions of greenhouse gases are determined using approaches similar to those described for products.

INDUSTRY

- Annual industrial electricity savings are determined using a peer-reviewed methodology similar to that used for the commercial sector.[15] The methodology distinguishes electricity savings due to ENERGY STAR from those due to utility run demand-side management (DSM) programs and other market transformation programs such as DOE's Industrial Technology Program (ITP). Greenhouse gas emissions are calculated using marginal CO_2 emissions as with products.
- For annual savings from natural gas and other fuels, industrial partners continue to either submit greenhouse gas emissions reductions reports through the federal Voluntary Reporting of Greenhouse Gases Program (1605(b)), or, in a small number of cases, work with EPA on an individual basis to estimate their emissions reductions. EPA reviews these submissions and adjusts the reported results to account for BAU improvements, structural changes in the sector that do not reflect efficiency improvements such as plant sales or closures, and program benefits attributable to the commercial building efforts or other federal programs. Process-related actions are included in the results, whereas activities such as recycling, lighting improvements, and transportation improvements are not.

COMMERCIAL BUILDINGS

- Annual electricity savings are determined based on a peer-reviewed methodology developed for the commercial building sector.[16] The methodology involves a counterfactual econometric analysis that forecasts state level electricity use in the absence of commercial building energy efficiency programs. Key determinants of electricity demand that are controlled for in the analysis include state energy prices, weather conditions, economic conditions, and the long-term U.S. trend in commercial sector electronic technologies. Once the net national change in electricity use due to publicly-funded energy efficiency programs is calculated, ENERGY STAR accomplishments are differentiated from other national and regional DSM and market transformation programs, including DOE's Rebuild and FEMP programs, so that ENERGY STAR savings do not overlap with those efforts. The methodology used for 2006 is an update of two former peer-reviewed methodologies used by EPA; nevertheless, the results of all three methodologies yield consistent estimates of ENERGY STAR accomplishments.[17]
- The peak power savings are estimated using system-specific factors that reflect the contribution of the energy savings from lighting and other building improvements to peak load savings.
- As with products, net energy bill savings reflect the incremental investment necessary to upgrade the building to ENERGY STAR specifications determined by using simple payback period decision criteria. EPA assumes most building and industrial facility improvements last at least 10 years and uses national commercial sector fuel prices.
- Avoided emissions of greenhouse gases are determined using marginal emissions factors for CO_2 as with products.

CLEAN ENERGY SUPPLY PROGRAMS

EPA announced two new partnership programs designed to increase the supply of clean energy technologies in the United States in 2001 in response to the President's National Energy Policy. Both the Green Power Partnership and the Combined Heat and Power Partnership have made tremendous progress over the past 5 years in providing cost-effective solutions for their partners and facilitating the explosive growth of green electricity generation and environmentally beneficial combined heat and power (CHP) across the country.

EPA's two Clean Energy Supply programs are dismantling market barriers by offering their hundreds of partners technical resources, credible benchmarks, access to expertise, and recognition for environmental leadership. Clean energy also brings environmental benefits such as the reduction of greenhouse gas emissions and criteria pollutants. The results have been impressive; in 2006 alone, EPA's Clean Energy Supply programs reduced greenhouse gas emissions by 3.7 MMTCE (see Table 15).

Green Power Partnership

Organizations ranging from Fortune 500 corporations to neighborhood businesses, large public universities to small private colleges, local communities to city, state, and federal government agencies all significantly increased their participation in EPA's Green Power Partnership in 2006. Partners continue to use electricity purchases from green power resources as an easy and compelling way to reduce the environmental impact of their operations, hedge against volatile energy prices, increase employee and stakeholder morale, and demonstrate environmental leadership.

In 2006, the Green Power Partnership:

- Increased the total number of partners to more than 650, with 150 new partners joining in 2006. These partners have committed to buying almost 7 billion kWh annually of green power, a 76-percent increase over 2005, and enough to run more than 575,000 average American homes (see Figure 18).
- Launched the Fortune 500 Green Power Challenge, a year-long initiative to double the collective green power purchases of eligible Fortune 500 corporations from 2.5 billion kWh annually to 5 billion kWh. Participating companies at the time of the launch included Wells Fargo & Company, Whole Foods Market, Johnson & Johnson, Starbucks, and the DuPont Company.
- Sponsored the College & University Green Power Challenge, which runs through April 2007 and ranks partner schools' purchases of green power against others in their athletic conference.
- Presented 18 Green Power Leadership Awards to top purchasers of green power and on-site renewable power systems (see p. 43).
- Introduced quarterly updated Top Partner lists for retail, college & university, local government, and federal government partners.
- Updated the program requirements to reflect the evolving green power marketplace.

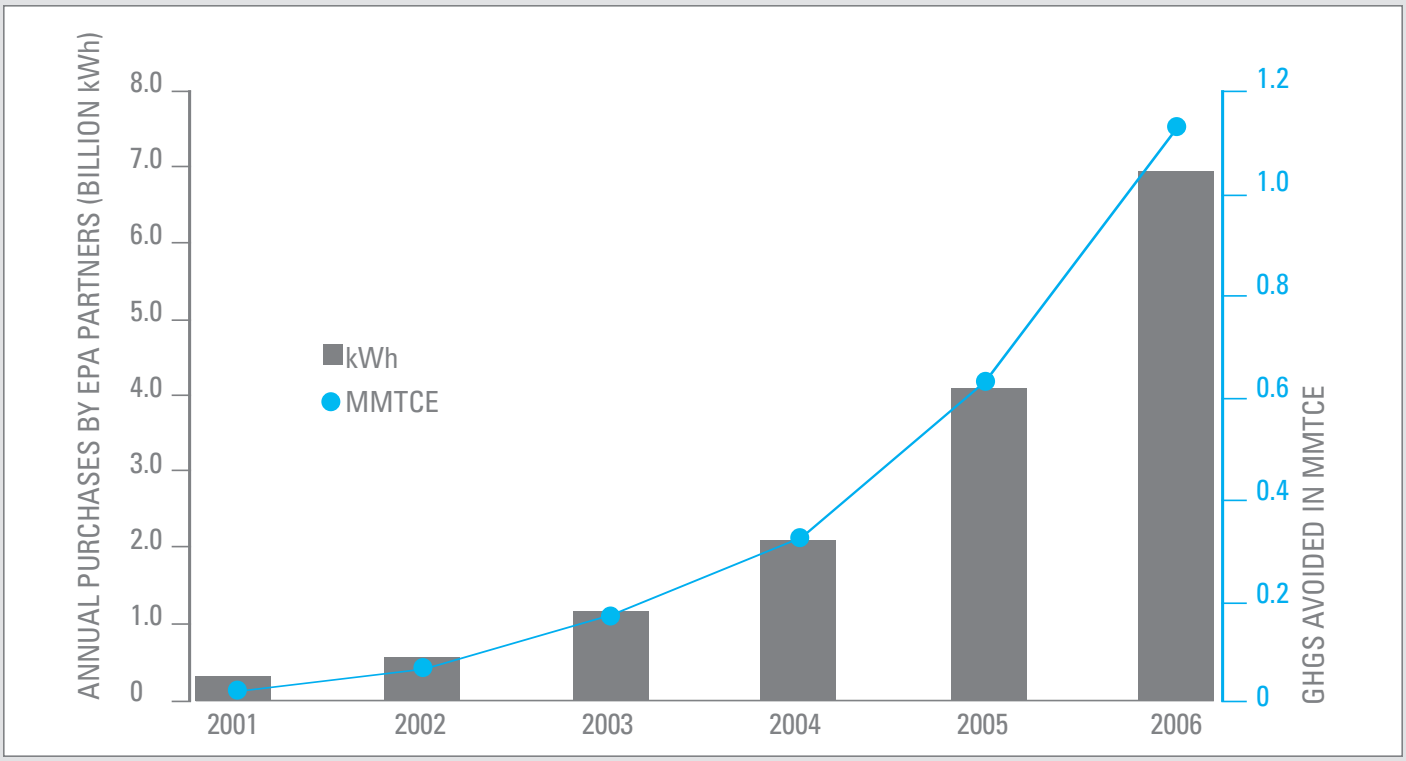
What to Expect in 2007 and Beyond

EPA will aggressively promote the Fortune 500 Green Power Challenge to current and prospective Fortune 500 partners, and will recognize the winners of the first College & University Green Power Challenge in April 2007. EPA will continue to work with green power suppliers to increase the supply of attractive green power products in the market. The program anticipates strong growth again in 2007 and has a goal of reaching almost 11 billion kWh in annual green power by year's end.

Combined Heat and Power Partnership

The CHP Partnership seeks to reduce the environmental impact of power generation by promoting the use of combined heat and power as an efficient, clean, and reliable approach to generating power and thermal energy from a single fuel source. CHP projects are up to 35 percent more efficient than traditional separate heat and power generation. The Partnership works closely with energy users, the CHP industry, state and local governments, and other stakeholders to support the development of new projects and promote their energy, environmental, and economic benefits. The program is playing a vital role in efforts to achieve the national goal of doubling the capacity of CHP in the United States to 92 gigawatts (GW) by 2010.

FIGURE 18. GREEN POWER PURCHASES AND AVOIDED GHG EMISSIONS ALMOST DOUBLED IN 2006



EPA RECOGNIZES 18 LEADING GREEN POWER PARTNERS IN 2006

GREEN POWER PARTNER OF THE YEAR

Aspen Skiing Company	*Aspen, CO*
HSBC - North America	*Buffalo, NY*
Johnson & Johnson	*New Brunswick, NJ*
Starbucks Coffee Company	*Seattle, WA*
Whole Foods Market	*Austin, TX*

GREEN POWER ON-SITE GENERATION AWARD

Chena Hot Springs Resort	*Fairbanks, AK*
County of Butte, CA Government Center	*Oroville, CA*
San Diego Unified School District	*San Diego, CA*

GREEN POWER PURCHASING AWARD

Coldwater Creek	*Sandpoint, ID*
Commonwealth of Pennsylvania	*Harrisburg, PA*
IBM	*Armonk, NY*
PrAna	*Vista, CA*
Staples	*Framingham, MA*
Stonyfield Farm	*Londonderry, NH*
The Holland, Inc.	*Vancouver, WA*
Tower Companies	*N. Bethesda, MD*
Vail Resorts	*Vail, CO*
WhiteWave Foods, Inc.	*Boulder, CO*

TABLE 15. GREENHOUSE GAS EMISSIONS AVOIDED BY EPA'S CLEAN ENERGY SUPPLY PROGRAMS (MMTCE)

	2002	2003	2004	2005	2006
Clean Energy Supply Programs	0.6	1.0	2.0	3.2	3.7

In 2006, the CHP Partnership:

- Grew to 200 Partners with 22 new partners and assisted the deployment of over 100 MW of new CHP nationwide, bringing the cumulative impact of the program to over 3,500 MW of new CHP (see Figure 19).
- Provided technical assistance to 30 candidate sites across the country, including those in the municipal, utility, biofuels, industrial, and financial sectors.
- Provided public support and recognition for highly efficient CHP projects, including a 2006 Partnership Certificate of Recognition for the University of New Mexico and a 2006 ENERGY STAR CHP Award for Exxon Mobil's Baytown Refinery—one of the largest customer-sited CHP systems in the country (see p. 45).
- Collaborated with states, regional organizations, and other federal agencies to promote CHP as an efficient application for biomass fuels.
- Offered training and ongoing support to the air regulatory community on the benefits of CHP and highlighted opportunities to encourage CHP through permitting and other regulatory frameworks.

What to Expect in 2007 and Beyond

EPA will continue to provide assistance in the development of CHP projects and expand its work with strategic sectors, including the rapidly growing ethanol industry. EPA will foster partnerships between rural electricity producers and facilities needing thermal energy for mutually beneficial economic and environmental projects. The CHP program will also begin outreach to municipalities on opportunities for CHP at water/wastewater treatment facilities.

In addition to its project-level CHP efforts, EPA will continue to reach out to states and municipalities and provide technical information on state energy, environmental, and utility practices that encourage environmentally beneficial CHP. A new *Biomass Catalog of Technologies* will be released to assist CHP industry partners, policymakers, and potential project managers in their efforts to use biomass and biogas to produce heat and power.

PROGRAM EVALUATION: MEASURING RESULTS IN THE CLEAN ENERGY SUPPLY PROGRAMS

COMBINED HEAT AND POWER PARTNERSHIP

Program partners such as project owners voluntarily provide project-specific information on newly operational CHP projects to EPA. These data are screened and any issues resolved.

Energy savings are determined on a project-by-project basis, based on fuel type, system capacity, and operational profile. Estimates of the use of fossil and renewable fuels are developed, as well as the efficiency of thermal and electrical use or generation, as appropriate.

Emissions reductions are calculated on a project-by-project basis to reflect the greater efficiency of on-site CHP. Avoided emissions of greenhouse gases from more efficient energy generation are determined using marginal emissions factors derived from energy efficiency scenario runs of an integrated utility dispatch model—Integrated Planning Model (IPM®)—and displaced emissions from boiler produced thermal energy are developed through engineering estimates. In addition, emissions reductions may include avoided transmission and distribution losses, as appropriate.

Only the emissions reductions from projects that meet the assistance criteria for the program are included in the program benefit estimates. EPA also addresses the potential for double counting of the benefits between this and other partnerships by having program staff meet annually to identify and resolve any overlap issues.

GREEN POWER PARTNERSHIP

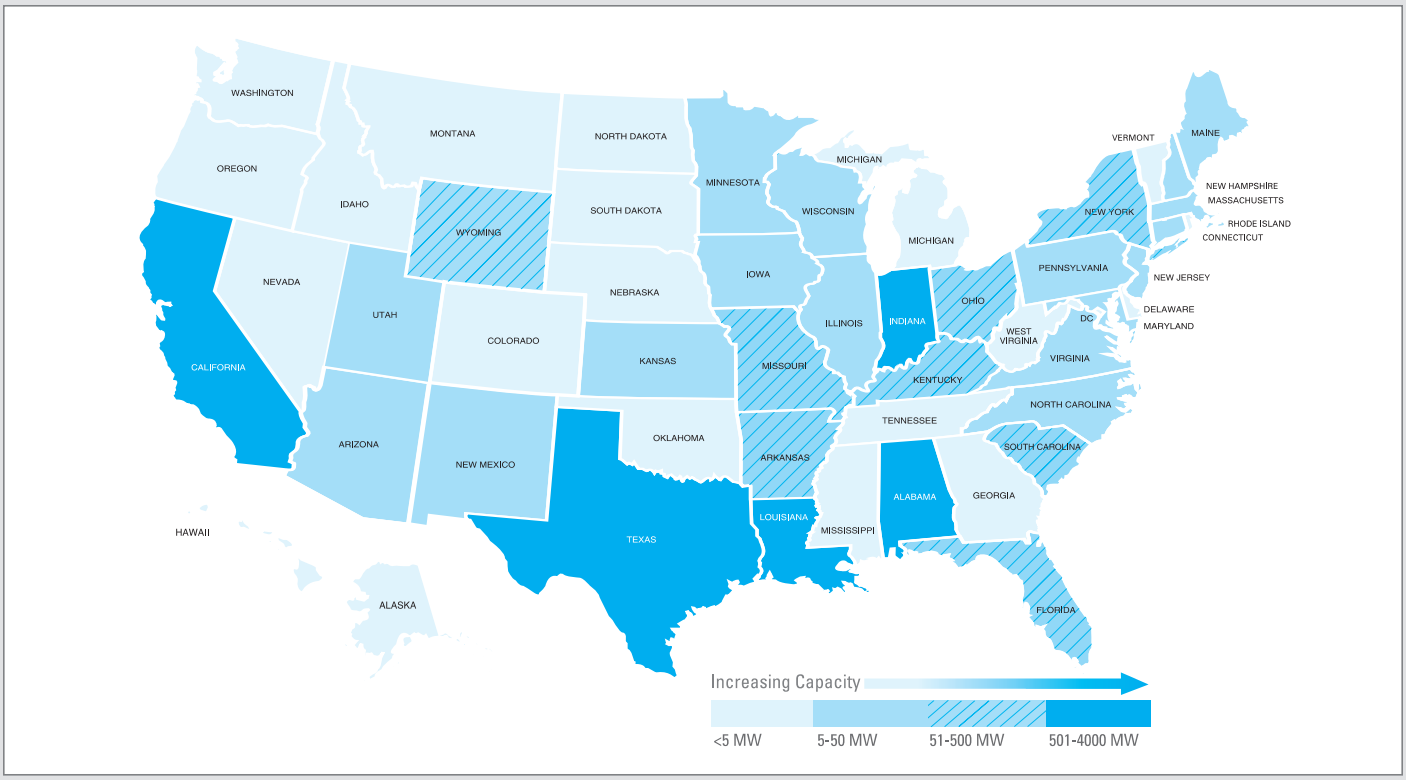
As a condition of partnership, program partners submit data on their purchases of qualifying green power products annually. These data are screened and any issues resolved.

Avoided emissions of greenhouse gases are determined using marginal emissions factors for CO_2 derived from scenario runs of IPM®.

The potential for double counting, such as counting green power purchases that may be required as part of a renewable portfolio standard or may rely on resources that are already part of the system mix is addressed through a partnership requirement that green power purchases be incremental to what may already be required.

EPA estimates that the vast majority of the green power purchases made by program partners are due to the partnership, as partners comply with aggressive green power procurement requirements (usually at incremental cost) to remain in the program. Further, EPA estimates that its efforts to foster a growing voluntary green power market have likely led to additional voluntary green power purchases that have not been reported through the program.

FIGURE 19. COMBINED HEAT AND POWER CAPACITY BY STATE AS OF 2006*



**All data are self-reported; states might have more capacity than reported or shown.*

2006 ENERGY STAR COMBINED HEAT AND POWER AWARD

EXXON MOBIL BAYTOWN CHP PROJECT; EXXONMOBIL *Baytown, Texas*

The combustion turbine-based CHP system produces up to 171 MW of electricity and 560,000 pounds of steam per hour to support one of the largest refinery complexes in the United States. With an estimated operating efficiency of 73%, the CHP system requires approximately 33% less fuel than typical on-site thermal generation and purchased electricity. Based on this comparison, the CHP system reduces greenhouse gas emissions by an estimated 619,000 tons of carbon equivalent per year.

2006 COMBINED HEAT AND POWER CERTIFICATES OF RECOGNITION

MUELLER ENERGY CENTER; AUSTIN ENERGY *Austin, Texas*

The Mueller Energy Center provides up to 4.3 MW of electricity, building heat, domestic hot water, and cooling to the Dell Children's Medical Center of Central Texas and the local utility grid/district cooling system. The CHP system is expected to operate at greater than 56% efficiency and use approximately 20% less fuel than equivalent separate heat and power—effectively reducing greenhouse emissions by an estimated 10,900 tons of carbon equivalent per year.

UNIVERSITY OF NEW MEXICO CHP PROJECT; UNIVERSITY OF NEW MEXICO *Albuquerque, New Mexico*

The University of New Mexico's Ford Utilities Center uses a 6 MW CHP system to supply the campus with roughly half of its total electricity demand during the winter months, along with space heating, cooling, and domestic hot water for the campus' more than 25,000 students, staff, and faculty. With an estimated operating efficiency of 76%, the CHP system requires approximately 16% less fuel than typical on-site thermal generation and purchased electricity—effectively reducing greenhouse gas emissions by an estimated 9,700 tons of carbon equivalent per year.

STATE AND LOCAL PROGRAMS AND INITIATIVES

Since 1992, EPA has provided state and local governments with assistance in their efforts to develop policies and programs to reduce energy costs, lower greenhouse gas emissions, improve air quality and public health, and promote economic development. This assistance is of critical importance to state and local governments as they address the continuing challenges of rising energy demand, rising energy prices, air quality issues, and global climate change.

The potential impact of state and local policies is enormous. EPA estimates that if all 50 states implemented cost-effective clean energy and environment policies, the projected growth in demand for electricity could be cut in half by 2025. The additional remaining increase in demand could be met with cleaner energy supplies. This translates into an annual savings of $70 billion in energy costs by 2025, avoiding the need for more than 300 power plants and preventing the greenhouse gas emissions equivalent to those from 80 million vehicles.

EPA is pursuing a number of strategies to help state and local governments explore and implement clean energy policies. The strategies include a state partnership program to advance clean energy policies, an informational network to assist local governments, and efforts to help utilities and their regulators explore policy options for increasing investment in energy efficiency, combined heat and power, and renewable energy. Through these programs, EPA provides comprehensive guidance on successful, cost-effective policies and initiatives; develops and distributes tools to measure and evaluate the multiple benefits of these policies; fosters peer exchange opportunities for state and local officials to share best practices and policy innovations; and recognizes outstanding achievements (see Table 16).

National Action Plan for Energy Efficiency

Clean EnergyEnvironment STATE PARTNERSHIP

Clean EnergyEnvironment MUNICIPAL NETWORK

Clean Energy-Environment State Partnership

In 2006, EPA:

- Expanded from the initial 11 charter members to a total of 14 state partners (see Figure 20).
- Published and distributed the *Clean Energy and Environment Guide to Action (GTA)*, which identifies and describes 16 clean energy policies and strategies that states have used to meet their clean energy objectives. These policies were selected for inclusion in the *GTA* because of their proven effectiveness in a number of states. States are using the *GTA* to learn from each other as they design and implement their own clean energy programs and policies.
- Supported state partners as they analyzed clean energy options and prioritized policies of interest, developed and implemented programs, and identified additional guidance and technical assistance from EPA that would be helpful in the coming years.
- Conducted more than nine peer exchange sessions through the EPA Clean Energy-Environment Technical Forum—involving a total of more than 150 state environmental, energy, and utility regulatory officials from over 35 states—to examine best practices on topics such as renewable energy credits, state energy planning, high performance buildings, and clean distributed generation.
- Hosted the 2nd Annual Clean Energy-Environment State Workshop, an opportunity for training and peer exchange on biofuels, the Lead by Example initiative, and quantifying co-benefits of their clean energy programs.
- Released the Co-Benefits Risk Assessment Model (COBRA), a peer-reviewed tool that enables officials to compare air pollution scenarios associated with different policies and incorporate human health effects into their decisions.

FIGURE 20. CLEAN-ENERGY ENVIRONMENT STATE PARTNERSHIP GROWS TO 14 PARTNERS IN 2006

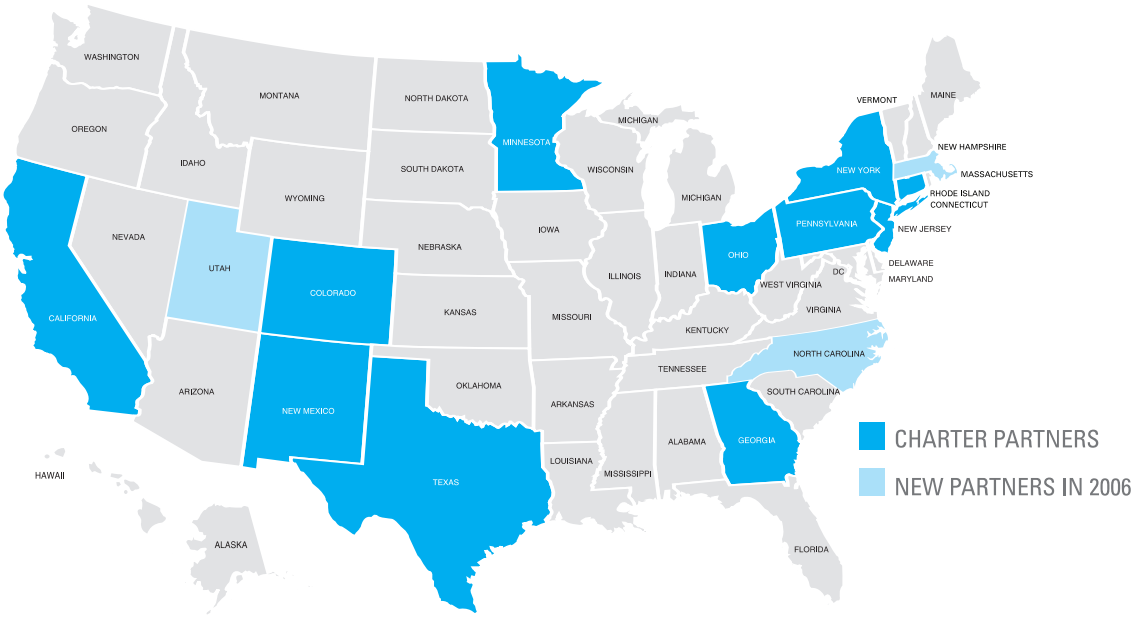


TABLE 16. EPA PROVIDES RESOURCES TO POLICYMAKERS DURING EACH STEP OF THE POLICY DEVELOPMENT PROCESS

STEP IN POLICY DEVELOPMENT	EPA RESOURCES AVAILABLE TO STATE AND LOCAL POLICYMAKERS
1. CREATE COLLABORATIVES	*Guide to Action* (GTA), Peer Exchanges
2. ESTABLISH POLICY GOALS	GTA, Clean Energy and Climate Policy Matrices, Emissions Inventorying and Modeling, Energy Efficiency and Renewable Energy Potential Studies, other EPA Climate Protection Partnership Programs
3. DESIGN POLICY	GTA, Co-benefits Analysis, Peer Exchanges, Clean Energy and Climate Policy Matrices, Heat Island Initiative, other EPA Climate Protection Partnership Programs
4. IMPLEMENT POLICY	Policy Review, Peer Review, Case Studies, Lessons Learned
5. MONITOR PROGRESS	Monitoring and Verification (M&V) Guidance, Policy Tracking, ENERGY STAR's Portfolio Manager

Clean Energy-Environment Municipal Network

In 2006, EPA assisted local governments by:

- Launching the Clean Energy-Environment Municipal Network, a complementary program to the Clean Energy-Environment State Partnership, to provide one-stop access to the wealth of EPA programs that offer technical assistance or membership to local governments.
- Helping cities reduce urban heat islands via workshops in Miami and Philadelphia and the establishment of a Center of Excellence on SMART Innovations for Urban Climate and Energy.

What to Expect in 2007 and Beyond

EPA will continue to support state and local governments as they develop, implement, and refine their clean energy activities. Specifically, EPA will:

- Add one additional state, bringing the total number of partners in the State Partnership program to 15 in 2007, and more in ensuing years.
- Maintain up-to-date, online information about the state clean energy policies in the *GTA* and additional policy developments.
- Develop additional tools and materials for implementing policies in the *GTA*, including a guidebook detailing ways to implement Lead by Example initiatives, a primer on assessing the multiple benefits of clean energy, and guidance on designing clean energy funds.
- Expand collaboration with program partners and provide targeted support for their efforts to develop and implement effective clean energy policies, including sponsoring peer exchange opportunities to assist states in learning about leading policies.

Clean Energy and Utility Policy Programs

Despite the economic and environmental benefits of energy efficiency, a range of barriers have hindered utilities and others from greater investment in these cost-effective opportunities. EPA continues to provide state public utility commissions and others with tools and resources for exploring and implementing policies that reduce barriers to adopting (or pursuing) comprehensive energy efficiency, renewable energy, and combined heat and power programs at the state and local level.

In 2006, EPA:

- Co-facilitated the National Action Plan for Energy Efficiency (Action Plan) with DOE. This effort has brought together a Leadership Group of more than 50 top utilities, utility regulators, state agencies, large energy users, consumer advocates, energy service providers, and environmental and energy efficiency organizations (see Table 18). During its first year, the Leadership Group and supporting organizations reviewed and identified barriers limiting greater investment in cost-effective energy efficiency; issued a comprehensive report to explore policies, practices, and efforts to overcome these barriers; and developed five key recommendations for increasing investment in cost-effective energy efficiency, as well as a number of options to consider in implementing the recommendations. The Leadership Group released its recommendations in summer 2006; in 66 public statements, 89 organizations across 46 states made commitments to support the Action Plan (see Table 17).
- Continued to provide technical assistance to the seven partners of the EPA-State Energy Efficiency Renewable Energy Pilots, including Arkansas, Connecticut, Hawaii, Minnesota, New Mexico, New Jersey, and the District of Columbia.
- Continued to provide electric sector policy assistance to state policymakers focused on state rules and policies that significantly affect the deployment of customer-sited clean distributed generation (DG), including advising the Oregon Public Utility Commission as it developed new interconnection rules, providing assistance to the Hawaii Public Utility Commission in evaluating rate structures for DG, and developing white papers on energy portfolio standards and the promotion of combined heat and power.

What to Expect in 2007 and Beyond

EPA will continue to assist interested state public utility commissions in their efforts to advance clean energy by continuing to share information on how states have removed barriers and pursued best practice policies and programs. EPA will also continue to facilitate the Action Plan in conjunction with DOE. In its second year, the Action Plan will focus on implementation, outreach, and development of additional guidance materials. Activities will include producing a series of guidebooks, holding regional implementation meetings, and establishing a new Sector Collaborative on Energy Efficiency that will engage businesses from five key sectors of the economy and utilities in addressing the barriers to and capturing the benefits of energy efficiency.

TABLE 17. IN 2006, 89 ORGANIZATIONS COMMITTED TO ADVANCING ENERGY EFFICIENCY THROUGH THE NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY

ACTION PLAN RECOMMENDATION	NUMBER OF ORGANIZATIONS MAKING A COMMITMENT UNDER THIS RECOMMENDATION*
Recognize energy efficiency as a high priority energy resource	47
Make a strong, long-term commitment to implement cost-effective energy efficiency as a resource	68
Broadly communicate the benefits of and opportunities for energy efficiency	49
Promote sufficient and stable program funding to deliver energy efficiency where cost-effective	11
Review and adopt policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments	26

**Numbers do not sum to 89 as some organizations made commitments to multiple recommendations.*

TABLE 18. NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY LEADERSHIP GROUP AND OBSERVERS

CO-CHAIRS

Diane Munns
President, National Association of Regulatory Utility Commissioners

Jim Rogers
President and CEO, Duke Energy

LEADERSHIP GROUP

Alliance to Save Energy
American Council for an Energy-Efficient Economy
American Electric Power
Austin Energy
Baltimore Gas and Electric
Bonneville Power Administration
California Energy Commission
California Public Utilities Commission
Connecticut Consumer Counsel
Connecticut Department of Environmental Protection
Connecticut Department of Public Utility Control
District of Columbia Public Service Commission
Entergy Corporation
Environmental Defense
Exelon
Food Lion
Great River Energy
ISO New England, Inc.
Johnson Controls
MidAmerican Energy Company
Minnesota Public Utilities Commission
Natural Resources Defense Counsel
New Jersey Board of Public Utilities
New Jersey Resources Corporation
New York Power Authority
New York State Public Services Commission
North Carolina Air Office
North Carolina Energy Office
Office of the Ohio Consumers' Counsel
Pacific Gas and Electric
PJM Interconnection
PNM Resources
Sacramento Municipal Utility District
Santee Cooper
State of Maine
Seattle City Light
Servidyne Systems, LLC
Southern California Edison
Southern Company
Tennessee Valley Authority
Texas State Energy Conservation Office
The Dow Chemical Company
Tristate Generation and Transmission Association, Inc.
USAA Realty Company
Vectren Corporation
Vermont Energy Investment Corporation
Wal-Mart Stores, Inc.
Washington Utilities and Transportation Commission
Waverly Light and Power
Xcel Energy

OBSERVERS

American Gas Association
American Public Power Association
Council of Energy Resource Tribes
Demand Response Coordinating Committee
Edison Electric Institute
Electric Power Research Institute
Energy Programs Consortium
Gas Appliance Manufacturers Association
National Association of Energy Service Companies
National Association of Regulatory Utility Commissioners
National Association of State Energy Officials
National Council on Electricity Policy
National Rural Electric Cooperative Association
North American Insulation Manufacturers Association
Steel Manufacturers Association

METHANE PROGRAMS

EPA continues to manage a suite of partnership and outreach programs designed to reduce emissions of methane from the major sources in the United States. Over twenty times more effective than CO_2 at trapping heat in the atmosphere, methane (CH_4) is both a potent greenhouse gas and a valuable energy resource (see Table 19). Methane recovery and utilization provides substantial opportunities for cost-effective GHG emissions reductions that deliver significant economic, environmental, and energy benefits.

EPA's methane programs include the Natural Gas STAR Program, AgSTAR, the Coalbed Methane Outreach Program, and the Landfill Methane Outreach Program. All follow a successful strategy—to provide reliable and comprehensive technical, economic, and policy information to facilitate the adoption of cost-effective emissions reduction technologies and practices. These programs also offer tools and targeted technical assistance to help both public and private sector partners implement methane reduction project opportunities. Partners can gain a competitive advantage by improving their operating efficiency and receive recognition from EPA for their leadership in reducing methane emissions.

In 2006, the methane programs saved a combined 16.1 MMTCE, an increase of more than 70 percent since 2000 (see Table 20). These climate partnerships, in conjunction with a regulatory program to limit air emissions from the nation's largest landfills, have reduced national methane emissions to 11 percent below 1990 levels, and they are projected to remain below 1990 levels through at least 2012 (see Figure 21).

Building off this success in the United States, EPA is now leveraging its experience and expertise to achieve both economic and environmental results on a global scale. Through the Methane to Markets Partnership, EPA is working with 20 national governments and more than 500 public and private sector organizations to advance the recovery and use of methane as a clean energy source (see Figure 22, p. 55).

Natural Gas STAR Program

Natural Gas STAR is a 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 methane emissions. Initiated in 1993, Natural Gas STAR partners with companies from all sectors of the natural gas supply chain—production, processing, transmission, and distribution—to reduce gas losses, improve system efficiency, and ensure that more gas gets to market. EPA has developed a range of tools and resources to help corporate partners implement a wide range of cost-effective methane reduction best management practices and technologies. The program achieved significant reductions through 2006 and is expected to reduce methane emissions from natural gas systems by more than 9.4 MMTCE in 2006 alone, with reductions of over 63 MMTCE since 1990.

In 2006, Natural Gas STAR:

- Achieved 62 percent industry participation across all major sectors (production, processing, transmission, and distribution).
- Partnered with seven new companies, bringing the total number of partners to more than 115.
- Launched the Natural Gas STAR International Program, with seven charter partners.
- Conducted six onsite and two online technology transfer workshops covering the four major gas sectors.
- Recognized seven outstanding partners with awards for significant corporate achievements in reducing methane emissions from oil and gas systems (see p. 53).

TABLE 19. GLOBAL WARMING POTENTIALS (GWPS) AND ATMOSPHERIC LIFETIMES OF GREENHOUSE GASES

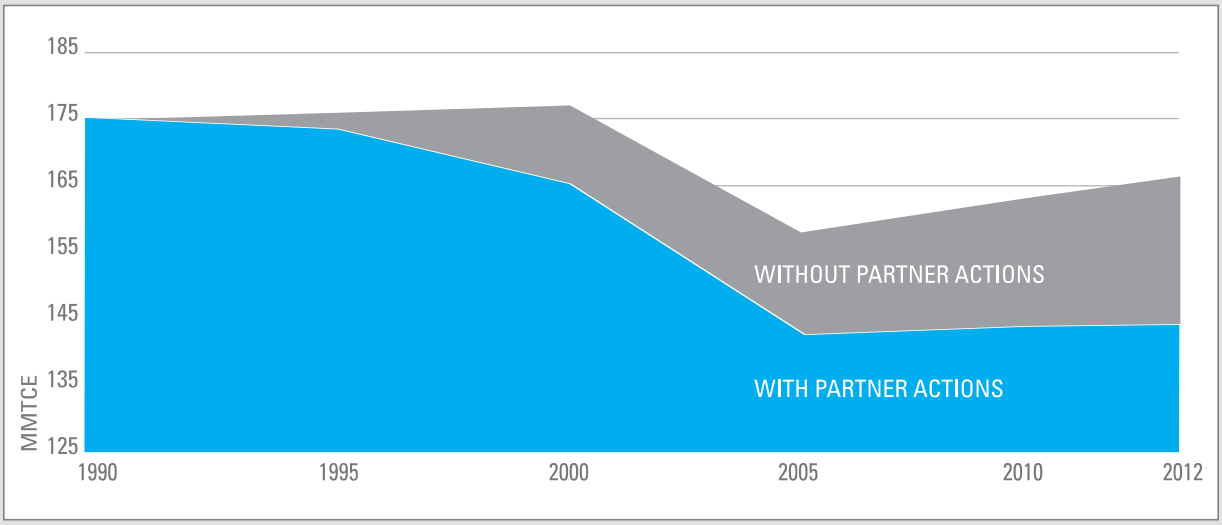
GREENHOUSE GAS	GLOBAL WARMING POTENTIAL FOR 100 YEARS	ATMOSPHERIC LIFETIME (YEARS)
Carbon Dioxide	1	50-200
Methane	21	12± 3
Nitrous Oxide	310	120
Hydrofluorocarbons	140-11,700	1.5-264
Perfluorocarbons	6,500-9,200	3,200-50,000
Sulfur Hexafluoride	23,900	3,200

Source: IPCC 1996

TABLE 20. EPA METHANE PROGRAMS MEET AND SURPASS GOALS

PROGRAM	2006 GOAL	2006 ACHIEVEMENT	2007 GOAL
NATURAL GAS STAR			
Industry Participation (% in program)	59%	62%	59%
Annual Gas Savings (MMTCE)	6.5	9.4	6.7
COALBED METHANE OUTREACH PROGRAM			
Annual Methane Reductions (MMTCE)	1.9	1.9	2.0
LANDFILL METHANE OUTREACH PROGRAM			
Number of Projects	309	336	329
Annual Methane Reductions (MMTCE)	4.8	4.8	5.2
TOTAL REDUCTIONS (MMTCE)	**13.2**	**16.1**	**13.9**

FIGURE 21. PARTNER ACTIONS ARE PROJECTED TO MAINTAIN METHANE EMISSIONS BELOW 1990 LEVELS THROUGH 2012



What to Expect in 2007 and Beyond

EPA will continue to support partners in the following ways as they implement programs to reduce their methane emissions:

- Provide one-on-one assistance and support to existing partner companies to promote new projects that expand their current methane emissions reduction activities.
- Conduct eight technology transfer workshops, including three Web-based workshops, to provide company representatives and other stakeholders with the opportunity to learn about technologies and practices for reducing methane emissions and partner experiences implementing the program.
- Continue to develop tools and resources that highlight environmental and economic benefits of methane reductions and facilitate company implementation of the program.
- Work with the partners in the newly launched Natural Gas STAR International to develop project plans for their international operations.

AgSTAR Program

Through the AgSTAR Program, EPA and the U.S. Department of Agriculture (USDA) collaborate with the nation's agriculture industry to reduce methane emissions by promoting the use of anaerobic digesters and biogas recovery systems to manage animal wastes. In addition to avoiding greenhouse gas emissions, the technologies and practices encouraged through AgSTAR generate farm revenues and reduce local water and air pollution. Currently, there are almost 200 operating or planned systems in the United States. EPA provides technical information and tools to help in the implementation and assessment of these projects.

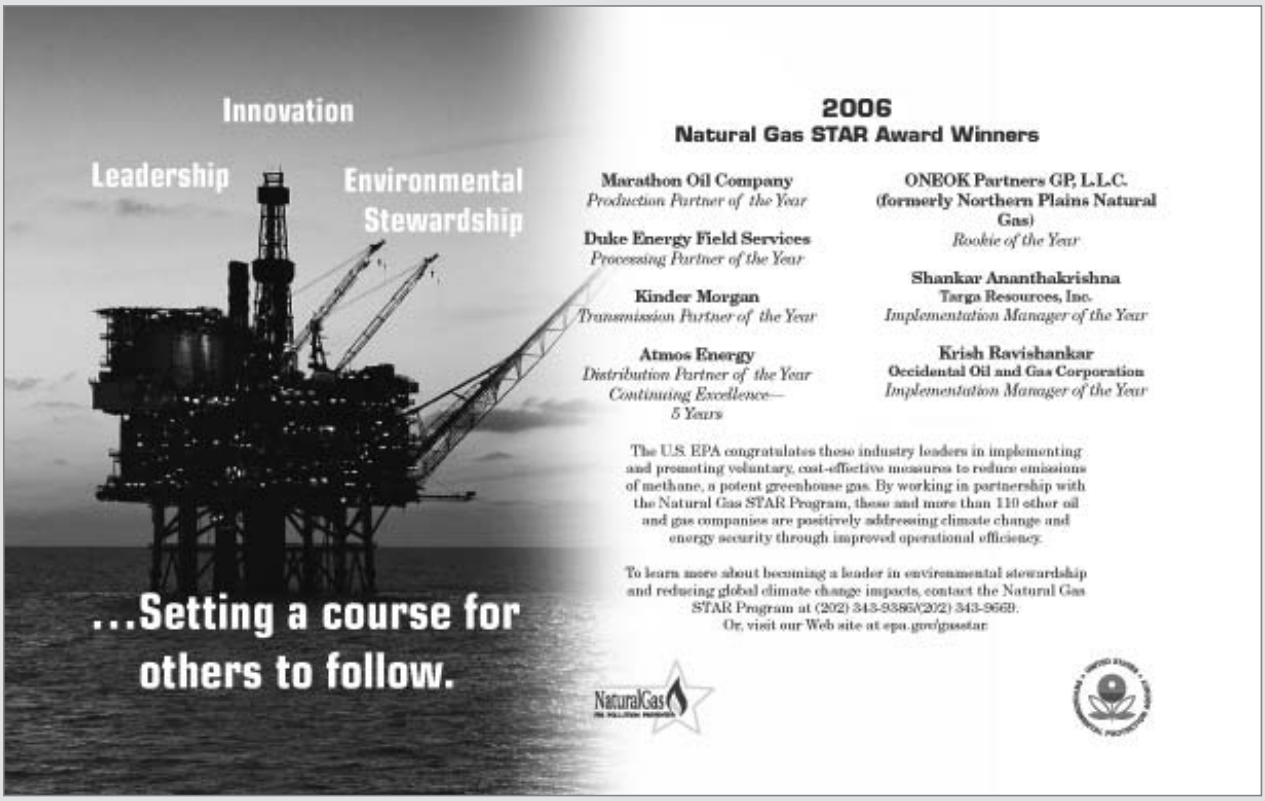
In 2006, EPA and USDA:

- Assisted livestock producers in project planning and implementation phases that, when completed, will produce nearly 275 million kWh/year of renewable energy from farms capturing methane. This energy will then be used by the farm and local community.
- Continued to expand methane reducing technologies in the livestock sector to help ensure clean water and air and held events with local extension services to market these opportunities. Such activities took place as part of the implementation of Section 9006 of the 2002 Farm Bill.
- Developed a new protocol for use by livestock producers, state agencies, project developers, and others involved in developing farm scale anaerobic digestion systems to standardize the performance evaluation of these systems and advance technology deployment.

What to Expect in 2007 and Beyond

- Collaboration with state energy programs across the country to facilitate the development of anaerobic digestion systems as renewable energy resources.
- Hosting a national conference to provide environmental, program, market, state-of-the-art technical, and funding information on anaerobic digestion systems.
- In collaboration with USDA and state energy programs, delivery of state and regional workshops to educate livestock producers and promote anaerobic digestion systems.
- Development of a national database to house information on current and pending anaerobic digestion systems.

NATURAL GAS STAR 2006 AWARD WINNERS



PRODUCTION PARTNER OF THE YEAR
MARATHON OIL COMPANY

Since 1994, when Marathon joined the program, it has reported more than 25 individual methane mitigation activities, resulting in the largest cumulative emissions reductions of any Gas STAR partner. In 2005, Marathon achieved the second highest normalized and fifth highest total emissions reductions of all production sector partners. These reductions were realized through the implementation of more than 10 technologies and practices. The company also conducted operational efficiency studies on several representative production and processing facilities. These studies formed the basis for the development of operational efficiency work plans, which are being implemented in 2006 in Marathon's upstream business units. Finally, Marathon contributed to the Program's international efforts in 2006, signing on as one of seven founding partners of Natural Gas STAR International.

PROCESSING PARTNER OF THE YEAR
DUKE ENERGY FIELD SERVICES

Duke Energy Field Services (DEFS), now DCP Midstream, joined the Natural Gas STAR Program in 2001. In 2005, it submitted the highest overall emissions reductions and third highest normalized reductions of the processing partners. These reductions were achieved by implementing six different technologies and practices. Vital to this effort, DEFS has launched its companywide BTU Efficiency Program to reduce gas loss and operate more efficiently. The program consists of cross-functional teams whose goal is to increase the efficiency of each company asset group through improved measurement and best practices for reducing gas losses.

TRANSMISSION PARTNER OF THE YEAR
KINDER MORGAN, INC.

Kinder Morgan originally joined the Natural Gas STAR program in 1993, but the company recently highlighted its commitment to the Program by signing a new Memorandum of Understanding in 2005. Kinder Morgan had the fourth highest normalized and fifth highest overall reductions of the transmission sector in 2005, implementing eight technologies and practices.

DISTRIBUTION PARTNER OF THE YEAR
ATMOS ENERGY CORPORATION

Atmos Energy joined the Natural Gas STAR program in 1999. Since then, it has reported 5 years in a row, submitting reports for activities from 2001 through 2005. During this time, the company has increased implementation and achieved significant emissions reductions. In 2005, Atmos reported the highest overall reductions and third highest normalized reductions of distribution partners. Atmos also has the third highest cumulative reductions of all distribution partners. To achieve its 2005 reductions, Atmos implemented four technologies and practices—reporting activities from more than seven locations.

ROOKIE OF THE YEAR
ONEOK PARTNERS GP, LLC

ONEOK Partners (formerly Northern Plains Natural Gas) joined the Natural Gas STAR Program as a transmission sector partner in 2005. This was the company's first year reporting, and it submitted reports for three subsidiaries, achieving the highest normalized reductions for the transmission sector and implementing numerous technologies and practices.

Coalbed Methane Outreach Program

The Coalbed Methane Outreach Program (CMOP) collaborates with large coal companies as well as related industries to reduce methane emissions from coal mines through the development of environmentally beneficial, cost-effective coal mine methane (CMM) recovery and utilization projects. CMOP efforts focus primarily on mitigating emissions from degasification systems at underground coal mines by providing high-quality, project-specific information and technical assistance to the coal mining industry and project developers. These efforts include 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.

As a result of EPA's successful collaboration with coal companies and specialized businesses, the percentage of drained coal mine methane that is recovered and used has grown from 25 percent in the early 1990s to more than 70 percent in 2006. To capture the remaining methane emitted from degasification systems, EPA is working with industry to use CMM for injection in natural gas pipelines (with or without upgrading, as needed), in power generation, and for mine heating and coal drying. EPA is also expanding its focus to include the methane emitted from coal mine ventilation systems and from abandoned underground mines. Mine ventilation systems account for about 77 billion cubic feet (Bcf) of U.S. methane emissions annually, or more than 50 percent of U.S. CMM liberated in a single year.

The program achieved significant results through 2006. Working with U.S. underground coal mine operators, CMOP achieved a reduction of 1.9 MMTCE in 2006. These results include those from about 20 projects that captured and used methane from some 30 U.S. abandoned mines.

In 2006, the Coalbed Methane Outreach Program:

- Launched a targeted outreach effort to the mining industry in the western United States and provided site-specific technical and economic analyses to increase mine methane capture and use at a mine in Utah.
- Promoted abandoned mine methane recovery by developing a robust methodology for estimating methane emissions from abandoned coal mines.
- Conducted a successful conference focusing on challenges and opportunities to CMM project development in the western United States.

What to Expect in 2007 and Beyond

- Continue to engage with coal mines in the western United States to promote project development.
- In cooperation with CONSOL Energy and DOE, support efforts to design, install, and operate the first test-scale demonstration of technology to mitigate and recover energy from dilute ventilation air in the United States.
- Develop enhanced tools to assist potential project developers, including a project finance model.
- Support the development of methane recovery and utilization projects at abandoned mines by identifying and developing a database of candidate mines and preparing case studies of successful projects.
- Organize a national conference to address the opportunities and challenges of CMM project development in the United States.

FIGURE 22. EXPORTING THE SUCCESS OF EPA'S DOMESTIC METHANE PROGRAMS: METHANE TO MARKETS (M2M)

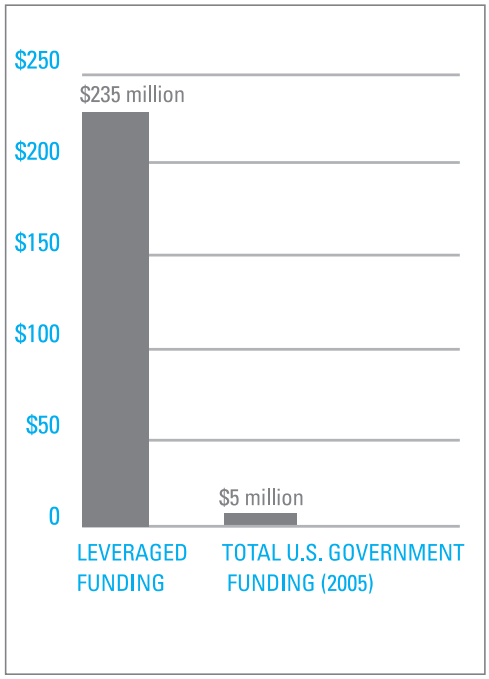
Methane to Markets

Launched in 2004, M2M is an international initiative that unites public and private interests to advance the capture and use of methane as a clean energy source. Building off its domestic methane programs, EPA is working with 20 countries and more than 500 private and public sector organizations to advance methane energy projects in four major areas: agricultural waste, landfills, underground coal mines, and natural gas and oil systems. U.S. efforts under the partnership are led by EPA and involve the collective efforts of six agencies and departments across the federal government.

In its third year, M2M is already realizing impressive results. Ongoing U.S.-supported projects overseas are expected to result in estimated annual reductions of approximately 5 MMTCE. U.S. contributions have also leveraged over $200 million in investment from other partner countries, development banks, the private sector, and members of the Project Network (see bar chart).

In 2007, the partnership will be highlighting its efforts at the first Methane to Markets Partnership Expo, to be held in Beijing, China. This landmark event, co-sponsored by EPA and China's National Development and Reform Commission, will be a forum for participants to share information and join forces on project development, technology deployment, financing, and policy. The Expo promises to be the premier international forum for promoting methane recovery, project opportunities, and technologies.

FUNDING AND LEVERAGED INVESTMENT (MILLIONS)



PROGRAM EVALUATION: MEASURING RESULTS IN THE METHANE PROGRAMS

EPA relies on the application of sound, comprehensive analyses to estimate the annual methane reductions from its programs. EPA gathers and carefully reviews partner data on all methane reduction activities implemented through the partnerships. Table 1 on p. 3 and Table 20 on p. 51 summarize the benefits attributable to EPA's methane programs.

For all programs, energy bill savings include the revenue from the sale of methane and/or the sale of electricity made from captured methane from qualified partner activities only. The expenditures include the capital costs agreed to by partners to bring projects into compliance with program specifications and any additional operating costs engendered by program participation. All financial benefits have been placed in present value terms.

NATURAL GAS STAR

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

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

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

LANDFILL METHANE OUTREACH

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

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

EPA uses emissions factors that are appropriate to the project. The factors are based on research, discussions with experts in the landfill gas industry, and published references.

COALBED METHANE OUTREACH

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

There are no regulatory requirements for recovering and using coal mine methane; such efforts are entirely voluntary. EPA estimates coal mine methane recovery attributable to its program activities on a mine-specific basis, based on the program's interaction with mines.

Landfill Methane Outreach Program

Although methane emissions from landfills have decreased by 18 percent since 1990, landfills are currently the largest methane emissions source in the United States, accounting for approximately 25 percent of all anthropogenic methane emissions. Launched in 1994, the Landfill Methane Outreach Program (LMOP) encourages the development of landfill gas energy (LFGE) projects. The program focuses its efforts on smaller landfills not required by EPA regulations to collect and combust their landfill gas, as well as larger, regulated operations that are combusting their gas, but not using it as a clean energy source. LFGE projects not only prevent the direct methane emissions from landfills, but also reduce indirect CO_2 emissions by displacing electricity generated from the burning of fossil fuels.

Through LMOP, EPA provides landfill owners and operators a suite of tools and technical resources to help them overcome the hurdles to LFGE project development, including feasibility analyses, decisionmaking software for evaluating project economics, a database of more than 550 candidate landfills, a project development handbook, and energy end-user analyses.

Over the past 12 years, LMOP has assisted 336 projects that reduced methane emissions from landfills and avoided CO_2 emissions, collectively amounting to about 33 MMTCE. In 2006 alone, LMOP emissions reductions totaled 4.8 MMTCE. In addition, the total number of operational LFGE projects grew to nearly 425 nationwide, and EPA assisted 35 new LFGE projects and nine project expansions that became operational during the year.

In 2006, the Landfill Methane Outreach Program:

- Assisted in the development of 35 new landfill gas energy projects and 9 project expansions, for a cumulative total of 336 projects since 1994.
- Welcomed 118 new partners, increasing participation by 24 percent and bringing the total number of LMOP partners to more than 600.
- Provided technical assistance to more than 20 corporations, helping them identify opportunities to advance landfill gas energy as a reliable, low-cost source of energy. Over 225 corporate and landfill searches and technical and economic analyses were conducted using EPA's innovative project evaluation software tools to identify LFG opportunities near corporate and industrial facilities.
- Highlighted more than a dozen landfills to attract investment opportunities during the 10th LMOP Conference and Project Expo. As a result, at least four of the landfills are moving toward landfill gas energy projects, with a total potential of producing 1.8 million standard cubic feet of methane per day (mmscfd), the energy equivalent of heating 4,000 homes.
- Garnered public attention for LMOP Partners and landfill gas energy projects, which were featured by numerous media outlets, including CNN, National Public Radio, and *Fortune*.
- Launched several new LMOP Partner tools and resources, including a new guide to federal, state, and foundation funding resources; LFGcost Web, a Web version of the LMOP project cost evaluation tool; and more than a dozen project profiles to highlight partner and project accomplishments.
- EPA recognized the outstanding accomplishments of four landfill methane partners and three exemplary projects at the 10th Annual LMOP Conference and Project Expo (see p. 57).

What to Expect in 2007 and Beyond

- Assist in the development of more than 30 new landfill gas energy projects.
- Expand efforts to promote the benefits of landfill gas energy to economic development offices, emphasizing job creation and tax revenue opportunities for states and communities.
- Host the 11th Annual LMOP Conference, Project Expo, and Awards Ceremony to showcase the top LMOP Partners and projects and discuss the latest industry trends.

2006 LANDFILL METHANE OUTREACH PROGRAM AWARDS

PROJECT OF THE YEAR
JACKSON COUNTY GREEN ENERGY PARK *North Carolina*

Landfill Gas Fuels North Carolina Local Economy. The Jackson County North Carolina Board of Commissioners boosted the county's economy by creating the Jackson County Green Energy Park where rapeseed grown by local farmers and landfill gas help produce over one million gallons of biodiesel, some of which is sold to the nearby Smokey Mountain National Park. The landfill gas is also used to provide process heat for a craft center that includes pottery and glass-blowing studios, blacksmithing, and forges.

PROJECT OF THE YEAR
LANCASTER COUNTY AND TURKEY HILL DAIRY *Pennsylvania*

Lancaster County Solid Waste Management Authority, Pennsylvania. Lancaster County Solid Waste Management Authority's (Authority) 3.2 megawatt landfill gas energy project involved a unique partnership among the Authority, PPL Corporation, and Turkey Hill Dairy. The Authority sells landfill gas to PPL Energy Services, which operates an electricity plant that uses Caterpillar engines to generate enough green electricity to power 2,000 homes. Waste heat from the engine exhaust is recovered to produce steam used in the adjacent Turkey Hill Dairy. Due to this combined heat and power project, Turkey Hill has reduced the use of diesel fuel in their boilers by 80 percent, achieving fuel cost savings and environmental benefits.

PROJECT OF THE YEAR
JEFFERSON PARISH AND CYTEC INDUSTRIES INC. *Louisiana*

Perseverance Provides Cytec with Affordable Energy. Renovar, the project developer, sells 1,820 cubic feet per minute of landfill gas collected from the Jefferson Parish Landfill to Cytec Industries, which uses it as the fuel for a process air pre-heater in a sulfuric acid regeneration plant. Cytec now has an affordable, reliable, and predictable energy source at a cost savings compared to the market price of natural gas on a per million Btu basis. This reduced cost enabled Cytec to offset the cost required to make retrofits to its duct work, gas burners, and control systems in order to utilize landfill gas.

PROJECT OF THE YEAR
JENKINS BRICK COMPANY *Alabama*

Jenkins Brick Locates Plant to Tap Landfill Gas. Jenkins Brick has been using clean-burning landfill gas to fuel its Montgomery, Alabama, brick plant since 1998. Jenkins decided to site its new plant at a location where it would once again be possible to take advantage of local landfill gas. The new project captures 600 cubic feet per minute of landfill gas from Veolia Environmental Services' Star Ridge Landfill and transports it via a 6.5-mile underground pipeline to Jenkins Brick's new $56 million state-of-the-art brick manufacturing plant in Moody, Alabama. There, the landfill gas is used as fuel in brick kilns.

COMMUNITY PARTNER OF THE YEAR
DEKALB COUNTY *Georgia*

DeKalb County Finds that Persistence Pays Off. DeKalb County, Georgia owns two Caterpillar engines that burn landfill gas from Seminole Road Landfill to produce electricity that is sold to Georgia Power. The project generates a minimum of 22,500 megawatt-hours per year of electricity, enough to power 3,000 homes. Development of this project required detailed planning and many meetings with county officials and the community to educate them about the benefits of landfill gas energy projects and alleviate potential concerns.

ENERGY END USER PARTNER OF THE YEAR
BMW MANUFACTURING *South Carolina*

BMW Manufacturing Expands Use of Landfill Gas. With excess landfill gas available and a continued desire to go "green," BMW focused its attention on the largest consumer of energy in the South Carolina assembly plant: the paint shop. Working with Dürr Systems, the shop's original designer, BMW converted paint shop equipment to burn landfill gas. In so doing, the facility became the world's first automotive paint shop to integrate the use of landfill gas in such a creative energy savings application.

ENERGY PROVIDER PARTNER OF THE YEAR
MURRAY CITY POWER (MCP) *Utah*

Murray City Power Overcomes Economic and Political Setbacks. Murray City Power (MCP) responded to a proposal from the Salt Lake City/County Landfill Gas Recovery Project and aggressively pursued the entire three megawatt capacity. To make the project economically feasible, MCP established a pricing profile with seasonal pricing for on-peak and off-peak hour components so that the project's power supply costs parallel daily and seasonal market pricing, even though the power is delivered on a flat 24-hour/7-day year-round basis.

STATE PARTNER OF THE YEAR
DELAWARE SOLID WASTE AUTHORITY (DSWA) *Delaware*

Delaware Solid Waste Authority Leads Sustainability. As early as 1995, Delaware Solid Waste Authority (DSWA) demonstrated its commitment to excellence in solid waste management when it began collecting landfill gas and selling it for electricity generation. With the addition of two new landfill gas electricity projects, every municipal solid waste landfill in Delaware managed by DSWA now has a landfill gas energy project. Such leadership earned DSWA LMOP's State Partner of the Year in 1999 and again in 2006.

HIGH GLOBAL WARMING POTENTIAL GAS PROGRAMS

Many gases with high global warming potentials (GWPs) are released as byproducts of U.S. industrial operations. EPA manages a suite of partnership programs that work closely with key industries to develop cost-effective operational improvements that will help reduce emissions of perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF_6). These three gases are all particularly potent greenhouse gases; they trap substantially more heat in the atmosphere than does CO_2 on a per ton basis (see Table 19, p. 51). PFCs and SF_6 also have very long atmospheric lifetimes. Three industries are implementing agreements to reduce emissions under the President's Climate VISION (Voluntary Innovative Sector Initiatives: Opportunities Now) plan (see Table 21). Despite the potential for sizable growth in high GWP greenhouse gas emissions, EPA's partner industries are expected to maintain their emissions substantially below 1990 levels through the year 2012 (see Figure 23). Greenhouse gas emissions reductions across these programs totaled 13.3 MMTCE in 2006 (see Table 22).

The Voluntary Aluminum Industrial Partnership (VAIP)

In support of the Climate VISION plan, the aluminum industry has committed to reducing direct carbon intensity by 53 percent from 1990 levels by 2010. This involves reducing emissions of perfluoromethane (CF_4) and perfluoroethane (C_2F_6), which are inadvertent byproducts of the smelting process, and reducing CO_2 emissions caused by the consumption of the carbon anode. This ambitious goal signifies an additional direct carbon intensity reduction of 25 percent beyond 2000 levels.

In 2006, the Voluntary Aluminum Industrial Partnership:

- Reduced 2.4 MMTCE in direct greenhouse gas emissions.
- Reduced PFC emissions by more than 75 percent and direct carbon emissions by more than 55 percent on a per-ton basis compared to the industry's 1990 baseline.
- Launched a PFC reduction project with Australia and China through the Asia Pacific Partnership for Clean Development and Climate.
- Updated several analytical tools, including those used for inventory reporting and smelter measurements, with new data collected through the partnership.
- Completed technology-type benchmarking analysis in support of partner efforts to further reduce PFC emissions.

HFC-23 Emission Reduction Program

HFC-23 is a byproduct in the production of HCFC-22, a common commercial and residential air conditioning refrigerant. Through its partnership with 100 percent of the U.S. HCFC-22 industry, EPA encourages the development and implementation of feasible and cost-effective processing practices and technologies that reduce HFC-23 emissions. Since the partnership began in 1993, U.S. HCFC-22 manufacturers have made significant progress in lowering emissions of HFC-23 through process optimization and thermal destruction. As a result, HFC-23 emission intensity has dropped dramatically.[18] In 2006, emissions were 7.0 MMTCE less than they would have been had production continued at 1990 emissions intensity levels.

The PFC Reduction/Climate Partnership for the Semiconductor Industry

Since its inception in 1996, this partnership has been a catalyst for semiconductor companies in Europe, Asia, and North America to set the first global industry target for reducing greenhouse gas emissions. Semiconductor manufacturers have worked alongside EPA to identify and implement PFC-reducing process changes and manufacturing tool improvements for the production of integrated circuits. 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 very 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 world's first industry-wide, global greenhouse gas emissions reduction target. The China Semiconductor Industry Association (CSIA) agreed to join the

[18] HFC-23 emission intensity is the amount of HFC-23 emitted per kilogram of HCFC-22 manufactured.

TABLE 21. CLIMATE VISION* GOALS FOR EPA'S HIGH GWP GAS PROGRAMS

EPA PROGRAM	CLIMATE VISION GOAL
Voluntary Aluminum Industrial Partnership (VAIP)	Has committed to achieving a direct carbon intensity reduction of 53% from 1990 levels by 2010.
The SF_6 Emission Reduction Partnership for the Magnesium Industry	Has committed to eliminating SF_6 emissions by the end of 2010.
The PFC Reduction/Climate Partnership for the Semiconductor Industry	Has committed to reducing absolute perfluorocarbon emissions by 10% below the 1995 baseline level by the end of 2010.

** Voluntary Innovative Sector Initiatives: Opportunities Now*

FIGURE 23. PARTNER ACTIONS ARE PROJECTED TO MAINTAIN EMISSIONS OF HIGH GWP GASES BELOW 1990 LEVELS THROUGH 2012

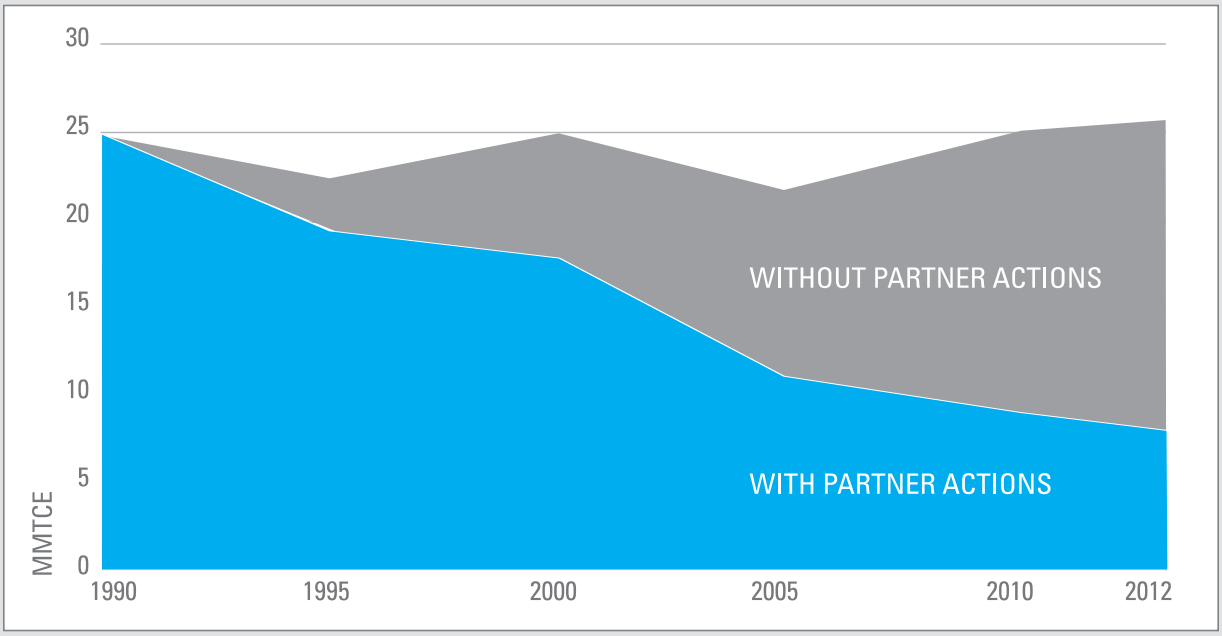


TABLE 22. GOALS AND ACHIEVEMENTS OF EPA'S HIGH GWP GAS PROGRAMS

PROGRAM	2006 GOAL	2006 ACHIEVEMENT	2007 GOAL
VOLUNTARY ALUMINUM INDUSTRIAL PARTNERSHIP (VAIP)			
Industry Participation (% in program)	98%	98%	99%
Reductions (MMTCE)	2.7	2.4	2.7
HFC-23			
Industry Participation (% in program)	100%	100%	100%
Reductions (MMTCE)	4.9	7.0	4.9
OTHER STEWARDSHIP PROGRAMS			
Industry Participation (% in program)*	50-100%	45-100%	50-100%
Reductions (MMTCE)	3.8	3.8	4.7
TOTAL REDUCTIONS (MMTCE)	**11.4**	**13.3**	**12.3**

** Participation varies from 45% of net generating capacity for electric power systems to 100% for primary magnesium producers.*

industry's climate protection initiative in 2006. China is the world's fastest growing production center for semiconductor devices as well as the largest single market for integrated circuit products.

The aggressive goal set by the WSC demonstrates the semiconductor industry's commitment to climate protection in the international community. The WSC and EPA's present challenge is to maintain flexibility and leadership when aligning the initiative with the industry's plan to include emerging production centers in Malaysia and Singapore.

In 2006, the PFC Reduction/Climate Partnership for the Semiconductor Industry:

- Reduced absolute PFC emissions by 2.3 MMTCE, or more than 75 percent below BAU levels, while U.S. manufacturing continued to expand. EPA's semiconductor industry partners are on track to meet their 2010 WSC/Climate VISION commitments.
- Published first report on PFC heat transfer fluid use and emissions from the semiconductor industry. The loss of these high GWP fluids may represent up to 5 percent of a semiconductor manufacturer's total (direct and indirect) greenhouse gas emissions.
- Facilitated emissions reduction technology transfer between related electronic manufacturing sectors, such as semiconductor and flat panel displays, to identify and implement the most cost-effective PFC reduction strategies.
- Introduced a new PFC emissions reporting format that improves how data are displayed and better describes the application of the International Panel on Climate Change's (IPCC's) estimating methods at the corporate level.
- Conducted EPA's first performance study of an installed PFC emissions abatement device with partner company, Qimonda. EPA and Qimonda are planning to conduct a follow-up study of the device in 2007.

Sulfur Hexafluoride (SF_6) Emissions Reduction Partnership for Electric Power Systems

SF_6 is the most potent and persistent greenhouse gas. Used primarily by electric utilities, SF_6 is a gaseous dielectric for high-voltage circuit breakers and gas-insulated substations. The global warming potential of SF_6 is 23,900 over a 100-year time period, which means it is 23,900 times more effective at trapping infrared radiation than an equivalent amount of CO_2.

In 1999, EPA partnered with several electric utilities to form a voluntary program to reduce SF_6 emissions. In addition to providing a means to actively address climate change, this program has helped partner companies reap financial savings through reduced SF_6 gas purchases. In 2006, partner companies reported SF_6 emissions of 1.1 MMTCE, bringing their average SF_6 emission rates down to 7.3 percent of the total equipment nameplate capacity. Members of the partnership represent 44 percent of the total U.S. transmission system.

In 2006, the SF_6 Emissions Reduction Partnership for Electric Power Systems:

- Recruited six new companies into the partnership: Montana-Dakota Utilities (ND); NSTAR Electric & Gas (MA); Oglethorpe Power Company (GA); PNM Resources (NM); Pacificorp (OR); and Seattle City Light (WA).
- Presented findings from the SF_6 circuit breaker leak study at the 4th International Conference on SF_6 and the Environment, showing that SF_6 emissions can be two times higher that expected. Held in San Antonio, TX, the conference was attended by 145 individuals from the electric power and magnesium processing sectors.
- Worked with partners to update SF_6 reduction goals through the year 2012.

SF_6 Emission Reduction Partnership for the Magnesium Industry

The U.S. magnesium industry and the International Magnesium Association (IMA) are working with EPA to identify and adopt best management practices for reducing and eliminating emissions of SF_6. Launched in 1999, this partnership works to reduce SF_6 emissions from magnesium production and casting operations and currently includes more than 80 percent of the U.S. magnesium industry. Partner companies are supporting the President's Climate VISION initiative and striving to completely eliminate their firms' SF_6 emissions by the end of 2010.

In 2006, the SF_6 Emission Reduction Partnership for the Magnesium Industry:

- Held SF_6 emissions steady at 2005 levels, equaling an absolute reduction of 23 percent since the program's inception in 1999. 2006 was the seventh year in which EPA collected annual SF_6 emissions reports from magnesium partners.
- Organized and led the 2nd International Melt Protection Users Group Round Table in conjunction with the 2006 Annual World Magnesium Conference in Beijing, China. More than 50 industry and government participants from Asia, Europe, North America, and the Middle East exchanged technical information on phasing out SF_6-based melt protection.
- Completed the third study of alternative melt protection technologies and associated air emissions. Partner company, Lunt Manufacturing, hosted the study that included the partnership's first trials with dilute sulfur dioxide (SO_2)-based cover gas. The preliminary results were presented at EPA's 4th International Conference on SF_6 and the Environment in San Antonio, TX, in November 2006.
- Maintained U.S. industry participation in the partnership, representing 100 percent of primary magnesium production and 80 percent of domestic casting and recycling capacity.
- Collaborated with the IMA, Japan Magnesium Association (JMA), and China Magnesium Association (CMA) to create and publish a technical brochure on alternative melt protection technologies. The brochure, published in English, Japanese, and Chinese, was introduced at the 2006 Annual World Magnesium Conference in Beijing, China.

Mobile Air Conditioning Climate Protection Partnership

Motor vehicle air conditioners contribute significantly to global greenhouse gas emissions through vehicle gasoline consumption and direct refrigerant emissions. In the United States alone, vehicle air conditioners use 7 billion gallons of gasoline every year, equivalent to over 16 MMTCE.[19] Refrigerant emissions contribute more than 8.0 MMTCE annually.[20]

In 1998, the Society of Automotive Engineers (SAE), the Mobile Air Conditioning Society Worldwide, and EPA formed a global partnership to reduce the climate impacts of mobile air conditioning (MAC) systems. The membership now includes most of the world's vehicle manufacturers and their suppliers, environmental and industry non-governmental organizations (NGOs), and representatives from industrialized and developing country governments. The MAC Partnership has four goals:

- Promote cost-effective designs and improved service procedures to minimize refrigerant emissions.
- Promote next-generation mobile air conditioning systems that are better for the environment while satisfying customer safety, cost, and reliability concerns.
- Communicate technical progress to policymakers and the public.
- Document current and near-term opportunities to improve the environmental performance of mobile air conditioning system design, operation, and maintenance.

The work under this partnership focuses on improving servicing practices and system energy efficiency and on identifying alternatives for the refrigerant HFC-134a. While HFC-134a has no ozone depleting potential and only one-sixth the global warming potential of the former MAC refrigerant, CFC-12, it is still a potent greenhouse gas. One pound of HFC-134a released to the atmosphere has the same potential global warming effect as 1,300 pounds of CO_2.

The partnership announced ambitious, quantitative goals in 2004 to reduce air conditioning fuel consumption by at least 30 percent and cut refrigerant emissions by 50 percent.

[19] Andersen, S., et al., 2004.

[20] HFC-134a emissions: the refrigerant most commonly used in mobile AC systems since 1994. This does not include emissions of CFC-12 from pre-1994 automobile models still in the U.S. fleet.

In 2006, the Mobile Air Conditioning Climate Protection Partnership:

- Introduced new, improved refrigerant recovery and recycling machines that result in six times lower HFC-134a emissions.[21] By 2015, these technical advances will reduce U.S. HFC-134a emissions by 2.4 million kilograms every year, equivalent to 425,000 MTCE.
- Demonstrated new leak-tight improved mobile air conditioning (IMAC) system that reduces AC energy consumption by up to 50 percent and reduces direct refrigerant emissions by more than 50 percent. Over its lifetime, an IMAC system will save more than $500 and avoid more than 4,500 lbs of greenouse gas emissions (see Figure 24).
- Announced a new cooperative project with Delphi, General Motors, Ford, Volvo, Fiat, The Mobile Air Conditioning Society, and DOE's National Renewable Energy Laboratory to demonstrate an environmentally superior vehicle air conditioning system that meets all EPA requirements and uses the refrigerant HFC-152a, which has 10 times less global warming impact than HFC-134a.[22]

What to Expect in 2007 and Beyond for the High GWP Gas Programs

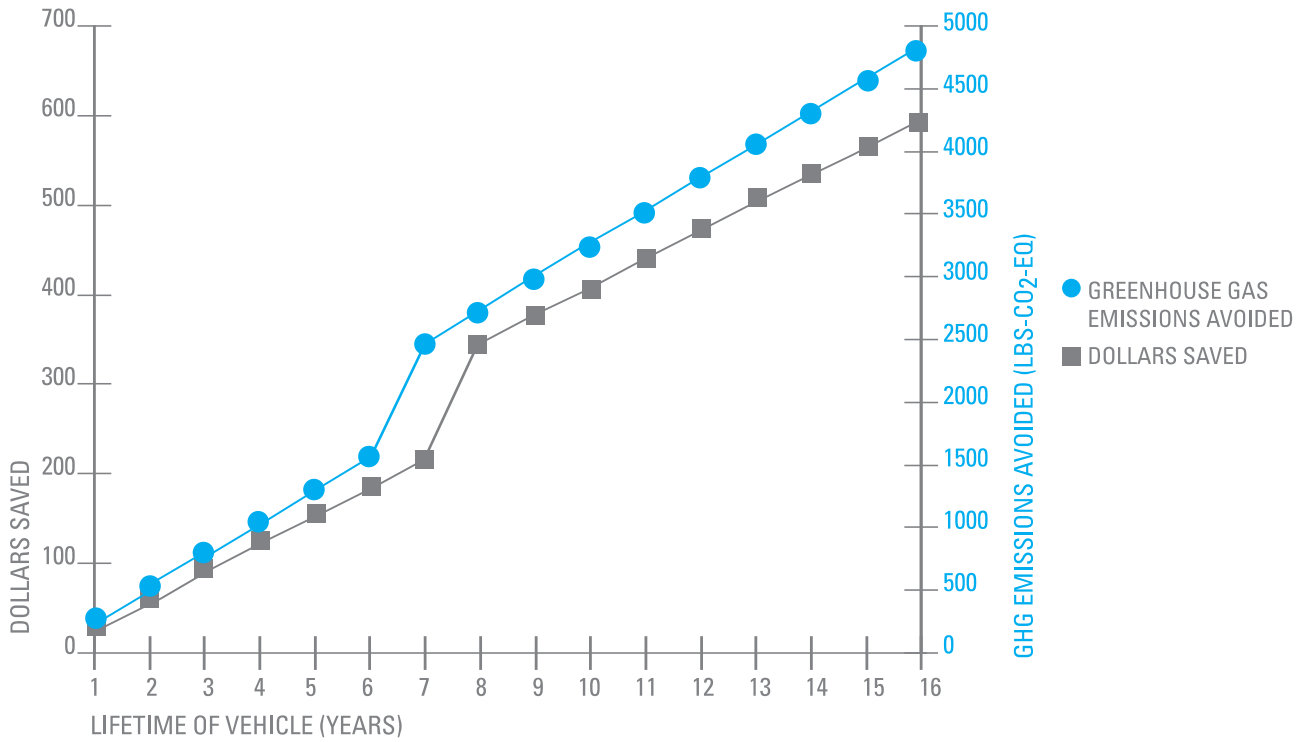
The High GWP Gas partnership programs for the industrial sector will continue to work with their partners and implement strategies to keep emissions below 1990 levels. EPA plans to:

- Continue to implement agreements with industry to reduce greenhouse gas intensity for the aluminum, magnesium, and semiconductor sectors through the Climate VISION effort.
- Host the 3rd Magnesium Melt Protection Users Group Round Table at the 64th Annual World Magnesium Conference in Vancouver, Canada. This EPA-sponsored workshop seeks to provide an open forum for the global magnesium industry to share experiences in testing and implementing emerging alternative melt protection technologies to eliminate SF_6 emissions by 2010.
- Conduct a fourth study of alternative magnesium melt protection technologies with partner company, Garfield Alloys. This study will provide the partnership its first look at how effectively the alternative technologies can protect a magnesium ingot casting operation.
- Continue to assist electric power partners in updating SF_6 reduction goals through 2012.
- Evaluate field performance of new SF_6 detection technologies for electric power systems.
- Launch Web-based technology sessions for electric power partners focusing on the technical aspects of various SF_6 emissions reduction options.
- Launch a Web-based emissions reduction training module for primary aluminum facility managers and pot-room operators. This module will increase awareness of greenhouse gas emissions from aluminum smelting and identify technical and operational opportunities to reduce them. Translation into other languages to facilitate global PFC emissions reduction efforts is also planned.
- Conduct a PFC Emissions Management Workshop in Beijing, China. China is the largest global producer of primary aluminum and has over 80 smelters.
- Perform a follow-up evaluation of a new electrically heated thermal PFC abatement device at semiconductor partner, Qimonda's, manufacturing facility. The goal of the follow-up study is to learn how performance of such devices may decline over time.
- Lead a collaborative effort to develop a new standard method for measuring PFC emissions abatement device performance.
- Maintain active partnerships with HCFC-22 chemical manufacturers to continue to reduce emissions of HFC-23.
- Complete a comprehensive life-cycle climate performance analysis of alternative refrigerant systems in conjunction with Mobile Air Conditioning Climate Protection Partnership members to identify the system with the lowest climate impacts. Partnership members will then select alternative technology for placement in future vehicles.

[21] Old refrigerant recovery and recycling machines recovered about 70% of the refrigerant in the vehicle AC system. Unrecovered refrigerant can escape to the atmosphere and add to the global greenhouse gas burden. New machines recover a minimum of 95% of the refrigerant.

[22] HFC-134a has a GWP of 1300. HFC-152a has a GWP of 120. HFC-152a also has the potential to reduce indirect greenhouse gas emissions (i.e., CO_2 emitted due to fuel combustion) because it is an inherently more energy-efficient refrigerant than HFC-134a.

FIGURE 24. OVER THE LIFETIME OF A VEHICLE, AN IMAC SYSTEM WILL SAVE MORE THAN $500 AND PREVENT MORE THAN 4,500 LBS OF GREENHOUSE GAS EMISSIONS*



** Due to their leak-tight design, IMAC systems do not require the refrigerant recharging that regular mobile AC systems do.*

PROGRAM EVALUATION: MEASURING RESULTS IN THE HIGH GWP GAS PROGRAMS

Annual high GWP gas reductions achieved by EPA's programs are estimated using well-established methods. Financial expenditures and savings are proprietary information of program partners and not included in the summary of economic benefits.

VOLUNTARY ALUMINUM INDUSTRY PARTNERSHIP

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

Reductions are calculated by comparing current emissions to a business-as-usual baseline that uses the industry's 1990 emissions rate. Changes in the emissions rate (per ton production) are used to estimate the annual greenhouse gas emissions and reductions resulting from the program.

The aluminum industry began making significant efforts to reduce PFC emissions as a direct result of EPA's climate partnership program. Therefore, all reductions achieved by partners are assumed to be the result of the program.

HFC-23 EMISSION REDUCTION PROGRAM

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

Reductions are calculated by comparing current emissions to a business-as-usual baseline that uses the industry's 1990 emission rate. Changes in the emissions rate are used to estimate the annual greenhouse gas emissions and reductions resulting from the program.

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

ENVIRONMENTAL STEWARDSHIP PROGRAMS

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

Reductions are calculated by comparing current emissions to a business-as-usual baseline, using industry-wide or company-specific emissions rates in a base year. The reductions in emissions rates are used to calculate the overall greenhouse gas emissions reductions from the program.

The share of the reductions attributable to EPA's programs are identified based on a detailed review of program activities and industry-specific information.

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United States
Environmental Protection Agency
Air and Radiation 6202J
EPA 430-R-07-010
www.epa.gov
September 2007

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