



ENERGY STAR® and Other Climate Protection Partnerships

ENERGY STAR

2009 Annual Report



ENERGY STAR® AND OTHER CLIMATE PROTECTION PARTNERSHIPS

2009 ANNUAL REPORT

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For additional information, please visit our websites 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 2009 Annual Report is EPA's Climate Protection Partnership Programs unless otherwise noted. Historical totals have been updated based on the most recent available data.

December 2010

Our global community faces numerous challenges that demand innovative solutions. Foremost among those challenges is climate change, and leading the way in innovative solutions are EPA's climate protection partners. The 2009 accomplishments of EPA's voluntary climate protection programs mark significant progress and help set us on a path of continued success. Highlights include:

- With the help of ENERGY STAR Americans saved \$17 billion in 2009 on their utility bills and prevented the equivalent of greenhouse gas emissions from 31 million vehicles.
- More than 1,200 partners have committed to purchase more than 17 billion kilowatt-hours of green power annually since the launch of the Green Power Partnership in 2002.
- Since the inception of the Combined Heat and Power Partnership in 2002, more than 350 partners have installed more than 4,800 megawatts of new combined heat and power.
- In 2009, members of EPA's methane and fluorinated greenhouse gas partnership programs used EPA tools and resources to avoid the equivalent of emissions from more than 20 million vehicles.

After 17 years and the work of thousands of partners, we can see that fighting climate change is not only good for our environment, it is also good for our economy and our health. EPA's ENERGY STAR and other climate protection programs are saving businesses and consumers money, while improving our health and the health of our environment. As we continue to address climate change and other global challenges, EPA will build upon the partnerships and successes of these programs in ways that make sense for the health and prosperity of our nation and the world.

Sincerely,



Lisa P. Jackson

Administrator

U.S. Environmental Protection Agency

EXECUTIVE SUMMARY



Combating global climate change continues to be one of the nation's most pressing environmental issues. Practical, proven, cost-effective solutions for reducing greenhouse gas (GHG) emissions already exist, but pervasive market barriers still hinder the adoption of and investment in energy efficiency, clean energy supply options, and other climate-friendly technologies and practices. For the past 17 years, the U.S. Environmental Protection Agency's (EPA's) climate protection partnership programs have worked to dismantle these barriers, yielding remarkable environmental and financial benefits (see Table 1).

EPA's partnerships offer a combination of voluntary standards, objective information, technical assistance, facilitated peer exchanges, and public recognition. These efforts have helped countless households, businesses, and organizations join the fight against global climate change. EPA's partners—along with American consumers—avoided GHG emissions across the residential, commercial, and industrial sectors and realized significant financial and environmental benefits (see Table 2, p. 5).

2009 was another banner year for EPA's climate protection partnerships.¹ More than 19,500 organizations across the country have partnered with EPA and achieved outstanding results:

- Preventing 83 million metric tons (in MMTCE²) of GHGs—equivalent to the emissions from 56 million vehicles (see Figure 4, p. 6)—and net savings to consumers and businesses of about \$18 billion in 2009 alone.
- Preventing more than 1,200 MMTCE of GHGs cumulatively and providing net savings to consumers and businesses of more than \$250 billion over the lifetime of their investments.
- Investing about \$80 billion in energy-efficient, climate-friendly technologies.

¹ This report provides results for the Climate Protection Partnership Programs operated by the Office of Atmospheric Programs at EPA. It does not include emissions reductions attributable to WasteWise, transportation programs, the Significant New Alternatives Program, or the landfill rule, which are the remaining actions in EPA's comprehensive climate program. EPA estimates that the reduction in greenhouse gas emissions across the entire set of climate programs to be about 120 million metric tons of carbon equivalent (MMTCE) in 2009.

² Million metric tons of carbon equivalent (MMTCE). Reductions in annual 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 period.

TABLE 1. Market Barriers Addressed by EPA's Climate Partnership Programs

AUDIENCE OR TARGET MARKET	MARKET BARRIERS ADDRESSED	CLIMATE PROTECTION PARTNERSHIP PROGRAM								
		ENERGY STAR	Climate Leaders	Green Power Partnership	Combined Heat & Power Partnership	State Climate and Energy Program	Local Climate and Energy Program	National Action Plan for Energy Efficiency	Methane	Fluorinated Gas
Energy Consumers	Lack of information about energy efficiency and renewable energy options	●		●	●				●	
	Competing claims in the marketplace	●		●						
	Lack of objective measurement tools	●	●	●						
	High transaction costs	●	●	●	●					
	Lack of reliable technical assistance	●	●	●	●					
	Split incentives	●								
	Perceptions of organizational risks	●	●	●						
	Lack of objective basis for recognition of environmental stewardship	●	●	●	●					
Utilities	Lack of objective measurement tools	●	●	●	●			●	●	●
	Lack of information about energy efficiency program costs and benefits	●			●			●		
	Disincentives for energy efficiency in existing regulations and energy planning processes							●		
Industries with Byproduct GHG Emissions*	Lack of reliable technical assistance		●						●	●
	Lack of objective basis for recognition of environmental stewardship		●						●	●
State and Local Policy and Decisionmakers	Lack of information about clean energy policies					●	●	●	●	
	Lack of reliable technical assistance					●	●	●	●	
	Lack of objective basis for recognition of environmental stewardship					●	●	●		

*Includes utilities.

Highlights of 2009

Promoting Energy Efficiency Through ENERGY STAR®

Energy efficiency is one of the lowest cost strategies for reducing GHGs. Since 1992, the ENERGY STAR program has served as a trusted source of information to help consumers and organizations throughout the nation adopt energy-efficient products and practices. Through ENERGY STAR, EPA continued to promote energy efficiency across the residential, commercial, and industrial sectors to help reduce GHG emissions, the primary cause of global climate change (see Figure 2, p. 5). In 2009, EPA's ENERGY STAR efforts helped Americans:

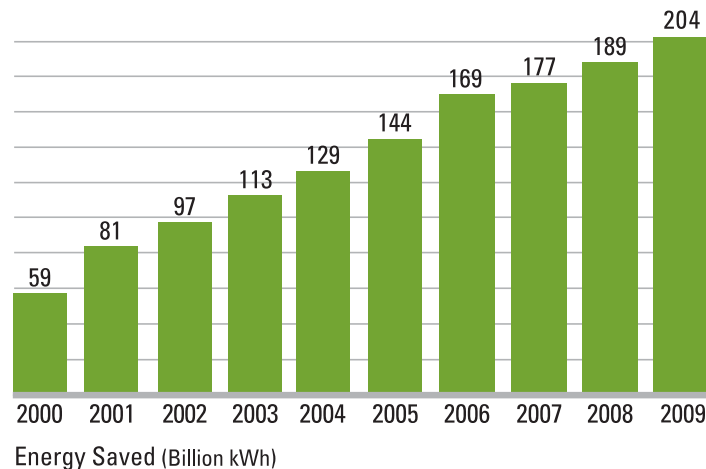
- Save more than 200 billion kilowatt-hours (kWh)—about 5 percent of U.S. electricity demand.
- Prevent the emissions of 46 MMTCE of GHGs—equivalent to the annual emissions from 31 million vehicles.
- Save \$17 billion on their energy bills.

These benefits are more than three times those in 2000 (see Figure 1). Additional ENERGY STAR program highlights, with notable achievements for 2009 and cumulatively, include:

ENERGY STAR Qualified Products

- More than 40,000 individual product models, produced by nearly 3,000 manufacturers, have earned the ENERGY STAR across more than 60 product categories.
- Americans purchased more than 300 million ENERGY STAR qualified products in 2009, bringing the total to about 3 billion since 2000.³

FIGURE 1. ENERGY STAR Benefits Continue To Grow



New Home Construction

- More than 1 million ENERGY STAR qualified homes have been built in the United States, surpassing a significant milestone. Over 100,000 were constructed in 2009 alone—representing more than 20 percent of housing starts.

Home Improvement

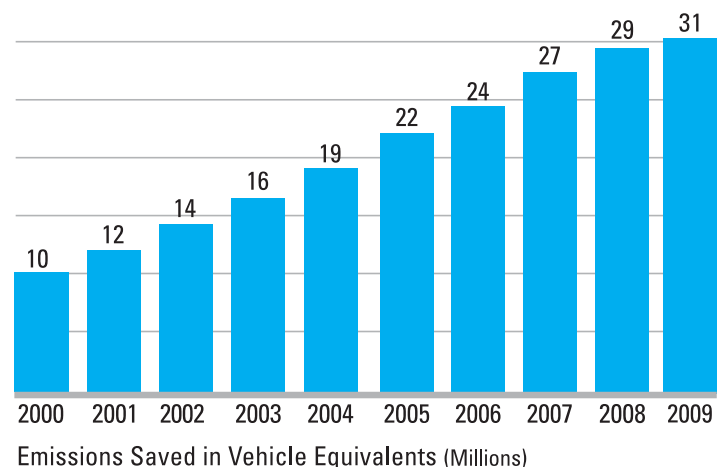
- Over 23,000 existing homes were retrofitted through Home Performance with ENERGY STAR in 2009—for a total of more than 75,000 retrofits—with the help of more than 30 program sponsors across 28 states.

Commercial Buildings

- Nearly 3,900 buildings earned the ENERGY STAR in 2009 for a cumulative total of almost 9,000 buildings—representing nearly 1.6 billion square feet of U.S. building space.
- More than 130,000 buildings, representing nearly 17 billion square feet—or 23 percent—of U.S. building space, were assessed for energy efficiency using EPA's Portfolio Manager.

Industrial Sector

- EPA benchmarked the energy performance of U.S. automotive plants for the second time, which indicated that fuel use has improved by 12 percent with energy savings translating to nearly 1.5 billion pounds of CO₂ emissions avoided.



³ Does not include purchases of compact fluorescent bulbs.

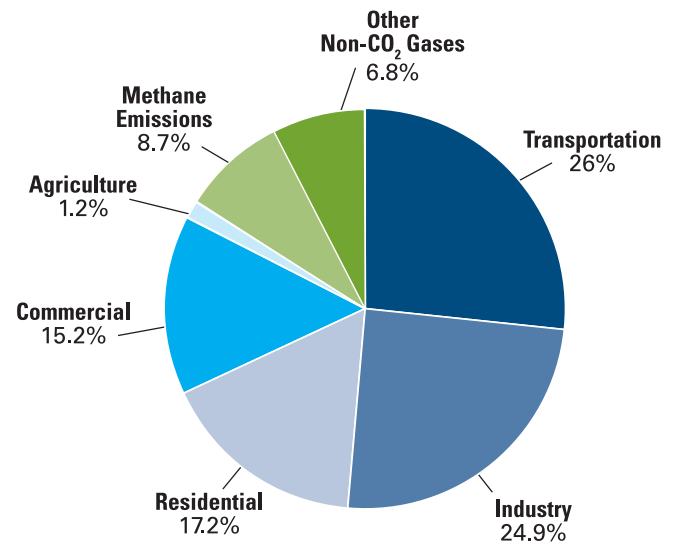
Promoting Corporate Environmental Leadership

Partners in EPA's Climate Leaders program are Fortune 500 and other leading corporations that have committed to aggressively reducing their GHG emissions. At least 55 percent of participating companies have publicly announced and are working to meet their aggressive GHG reduction goals. Of those, 29 partners have achieved their emissions reduction goals and 19 of them are pursuing new goals. EPA estimates that the GHG emissions reduction goals set by Climate Leaders partners will reduce GHG emissions by 47.5 MMTCE between 2005 and 2012, equivalent to preventing the annual GHG emissions from 33 million vehicles.

Transforming the Clean Energy Marketplace

EPA's Clean Energy Supply programs—the Green Power Partnership and the Combined Heat and Power (CHP) Partnership—are designed to increase the nation's supply of clean energy and accelerate the adoption of clean energy supply technologies throughout the United States (see Figure 3, p. 6). Since 2001, these programs have provided technical assistance and recognized significant purchasers of renewable energy. By engaging more than 1,200 partners in the purchase of more than 17 billion kWh of green power and more than 350 partners in the installation of over

FIGURE 2. U.S. CO₂ Emissions by Sector and Non-CO₂ Gases by Percent of Total GHGs



Source: EPA, 2010b

TABLE 2. Annual and Cumulative Benefits From Partner Actions Through 2009 (in Billions of 2009 Dollars and MMTCE)

PROGRAM	BENEFITS FOR 2009		CUMULATIVE BENEFITS 1993 – 2019			
	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	\$17.1	46.3	\$316.2	\$73.9	\$242.3	649
Qualified Products and Homes	\$9.8	20.2	\$151.7	\$24.4	\$127.4	276
Buildings	\$5.6	18.9	\$129.9	\$41.7	\$88.2	263
Industry	\$1.7	7.2	\$34.5	\$7.8	\$26.7	109
Clean Energy Programs	—	6.5	—	N/A	—	93
Methane Programs	\$0.7	17.9	\$13.9	\$5.4	\$8.5	259
FGHG Programs	—	12.3	—	N/A	—	254
TOTAL	\$17.8	83.0	\$330.1	\$79.3	\$250.8	1,255

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 page 51.

—: Not applicable

N/A: Not available

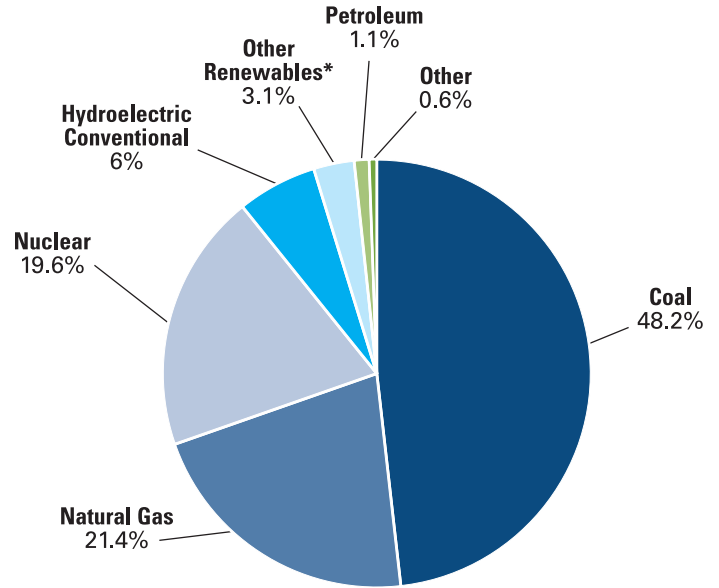
295 megawatts (MW) of new CHP capacity, the Clean Energy Supply programs reduced GHG emissions by 6.5 MMTCE in 2009 alone.

Sharing Best Practices Across State and Local Governments

Significant informational and institutional barriers can prevent state and local entities from implementing policies and making investments that spur development in energy efficiency and clean energy. EPA made important progress assisting state and local governments in exploring and implementing a broad range of energy efficiency, clean energy, and climate change policies and programs.

- EPA launched the new State Climate and Energy Partner Network, which enables states to learn from each other about climate change and clean energy initiatives by sharing policy news and exchanging information and ideas.
- The EPA- and U.S. Department of Energy (DOE)-facilitated National Action Plan for Energy Efficiency released five issue papers that share policy and program options for removing key barriers to energy efficiency.

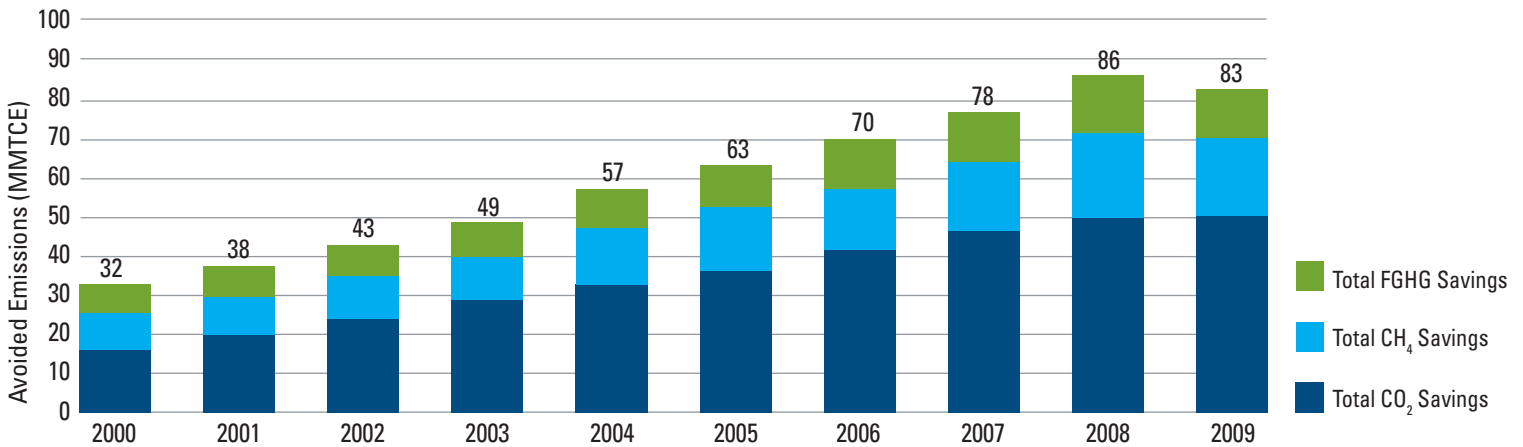
FIGURE 3. U.S. Electricity Generation by Fuel Type



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

Source: EIA, 2010c

FIGURE 4. GHG Emissions Reductions Exceed 83 MMTCE—Equivalent to Emissions From 56 Million Vehicles



Reducing Methane Emissions and Recovering an Energy Resource

Methane is both a potent GHG and a highly desirable clean fuel. EPA's methane programs continued to reduce the emissions of this GHG from landfills, agriculture (manure management), oil and natural gas systems, and coal mines and to develop projects to recover and use the methane whenever feasible. In 2009, these programs avoided GHG emissions of 17.9 MMTCE, exceeding their emissions reduction goals and maintaining national methane emissions from these target sources 14 percent below 1990 levels.

Reducing Fluorinated GHG Emissions

Many of the fluorinated gases—including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)—are extremely powerful and persistent GHGs. Together, these programs avoided 12.3 MMTCE of GHG emissions in 2009.

Recognizing Partner Accomplishments

EPA recognized the accomplishments of many outstanding partners in its climate protection partnership programs with the following awards:

- ENERGY STAR Award Winners (see Table 6, p. 12)
- Green Power Leadership Awards (see Table 12, p. 32)
- ENERGY STAR CHP Awards (see Table 14, p. 34)
- Natural Gas STAR Awards (see Table 16, p. 40)
- Landfill Methane Outreach Program Awards (see Table 17, p. 44)

The 2009 Annual Report

EPA's programs continue to advance GHG reduction goals and deliver greater benefits each year. These benefits can only grow as more organizations, households, and others adopt the practices promoted by the climate protection partnerships (see Table 3). This annual report presents detailed information on EPA's 2009 efforts within each of the partnerships mentioned in this section. Each individual program section includes:

- Program overview and accomplishments.
- Environmental and economic benefits achieved in 2009.
- Goals for the future.
- Summaries of the major tools and resources offered by the program.

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 (these methods are reviewed in the Demonstrating Progress section of the report, p. 51). 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 3. Long-term GHG Reduction Goals for EPA Climate Partnership Programs (MMTCE)

PROGRAM	ACCOMPLISHMENTS		GOALS	
	2009	2012	2015	
ENERGY STAR*	46.3	52	64	
Clean Energy Supply Programs	6.5	8	12	
Methane Programs	17.9	18	20	
Fluorinated Greenhouse Gas Programs	12.3	19	22	
TOTAL	83	97	118	

*Does not include ENERGY STAR products managed by DOE.



Despite the recent economic downturn, consumers, businesses, and organizations continue to fight global climate change by investing in energy-efficient technologies and practices. Improving the efficiency of the nation's buildings, homes, and industries is the fastest, most cost-effective solution to reducing GHG emissions in the near term and combating global climate change in the long term. The more we invest in energy efficiency, the greater the down payment we make on a sustainable environment for future generations. Not only do these investments reduce costs and protect the environment, they also help address volatile energy prices, strengthen energy security, create new jobs, and spur economic growth.

The ENERGY STAR program advances the adoption of energy efficiency across the residential, commercial, and industrial sectors of the U.S. economy. By using unbiased information, market-based partnerships, technical assistance, objective measurement tools, and consumer/business outreach, the program dismantles market barriers and catalyzes action.

Since EPA launched ENERGY STAR in 1992, this innovative voluntary program has transformed the marketplace by providing trustworthy, objective information to homeowners, businesses, and consumers on the reliable, cost-effective, efficient products, practices, and services that reduce energy use and GHG emissions. In 1996, DOE joined with EPA and assumed specific ENERGY STAR program responsibilities. In 2009, EPA and DOE signed a new agreement designed to enhance and strengthen the trusted ENERGY STAR program. Benefits have grown steadily since the program's inception and will continue to grow as consumers and businesses leverage ENERGY STAR and take action to:

- Select efficient products in over 60 product categories.
- Invest in home improvement retrofits.
- Purchase efficient new homes.
- Enhance the efficiency of public and private commercial buildings.
- Design efficient buildings.
- Improve the efficiency of industrial facilities.

Achievements in 2009

National Benefits

The combined achievements across all facets of the ENERGY STAR program are impressive (see Table 4):

- **Financial Savings.** Americans saved \$17 billion on their utility bills across the residential, commercial, and industrial sectors.
- **Energy Savings.** Americans avoided the need for more than 200 billion kilowatt-hours (kWh) of electricity or about 5 percent of the total 2009 U.S. electricity demand.
- **GHG Emissions Prevented.** Americans avoided 46 million metric tons of GHG emissions, equivalent to the GHG emissions from 31 million vehicles.

TABLE 4. ENERGY STAR Program Achievements Exceed Goals in 2009

	2009 ENERGY SAVED (BILLION KWH)		2009 EMISSIONS AVOIDED (MMTCE)		2010 EMISSIONS AVOIDED (MMTCE)
	GOAL	ACHIEVED	GOAL	ACHIEVED	GOAL
All Qualified Products ¹	—	101.0	20.5	19.6	22.5
New Homes ²	—	2.1	1.3	0.6	1.5
Commercial Building Improvements ³	—	82.7	14.5	18.9	15.5
Industrial Improvements ⁴	—	18.4	4.5	7.2	4.9
PROGRAM TOTAL for ENERGY STAR	190	204.2⁵	40.8	46.3	44.4

¹Results for qualified products from Homan et al., 2009. ²Results for qualified homes from CPPD, 2009. ³Results from building improvements based on methodology presented in Horowitz, 2009.

⁴Electricity results from industrial improvements based on methodology presented in Horowitz, 2009. ⁵The kWh savings imply peak demand savings of more than 35 gigawatts (GW), based on conservation load factors developed by LBNL (Koomey et al., 1990).

—: Not applicable

Key Achievements by Program Focus

About 40 percent of the program benefits realized in 2009 can be attributed to the purchase and use of products and new homes that earned the ENERGY STAR. Promoting energy management strategies for organizations in the commercial and industrial sectors accounted for the remaining 60 percent. Other key achievements in 2009 included (see Table 5, p.11):

- **ENERGY STAR Awareness.** Public awareness of the ENERGY STAR label was greater than 75 percent. Additionally, more than 80 percent of households had a high or general understanding of the label.
- **Products.** In 2009, American consumers purchased more than 300 million products that had earned the ENERGY STAR—despite the economic downturn—for a cumulative total of about 3 billion products purchased since 2000.⁴
- **Residential Buildings.** EPA announced that 1 million ENERGY STAR qualified homes were built in the United States between 1995, when EPA established the label for homes, and late 2009. More than 100,000 new homes were constructed to meet ENERGY STAR guidelines in 2009 alone, representing over 20 percent of new home starts nationwide.⁵
- **Commercial Buildings.** Through 2009, more than 2,400 organizations joined the Challenge to reduce energy use in their buildings by 10 percent or more, and nearly 25 percent of the nation's building space was assessed for energy performance. To date, nearly 9,000 buildings have earned the ENERGY STAR, while 230 new building design projects have achieved Designed to Earn the ENERGY STAR.
- **Industrial Facilities.** EPA's ENERGY STAR Industrial Focuses expanded to include 18 sectors with the launch of a new Metalcasting Focus. Thirty plants earned the ENERGY STAR—including eight for the first time in the pharmaceutical manufacturing and frozen fried potato food processing sectors—bringing the total to 54.

⁴ Compact fluorescent bulbs are not included in the number of ENERGY STAR qualified products purchased.

⁵ Single family site-built new homes.

Partnership-Driven Change

More than 17,000 organizations across the United States have partnered with ENERGY STAR to realize significant environmental and economic benefits. These partners include:

- **Manufacturers.** Nearly 3,000 manufacturers using the ENERGY STAR label to differentiate over 40,000 individual product models across more than 60 product categories.
- **Retailers.** More than 1,500 retail partners bringing products that have earned the ENERGY STAR and educational information to their customers.
- **Builders.** Over 8,500 builder partners constructing new homes that qualify for the ENERGY STAR in every state and the District of Columbia—saving homeowners money while maintaining high levels of comfort.
- **Service and Product Providers.** Hundreds of service and product providers actively working with clients to adopt a whole-building approach to energy management and helping some 4,500 client buildings improve efficiency by at least 10 percent through 2009.
- **Building and Facility Owners.** More than 3,600 private businesses, public sector organizations, and industrial facilities investing in energy efficiency and reducing energy use in their buildings and facilities.
- **Energy Efficiency Program Sponsors.** More than 45 states, 700 utilities, and many other energy efficiency program sponsors leveraging ENERGY STAR resources to improve the efficiency of commercial buildings, industrial facilities, and homes.
- **Industrial Partners.** More than 600 industrial program partners (a record number) working within their industry to identify ways to manage energy strategically, minimize energy risks, and reduce emissions.
- **Other Partners.** Thousands of energy raters, financial institutions, architects, and building engineers making energy efficiency more widely available through ENERGY STAR, thus providing additional value to their customers.
- **Environmental Leaders.** EPA and DOE recognizing the outstanding commitments of 110 partners at the 2010 Partner of the Year Awards (see Table 6, p. 12).

TABLE 5. ENERGY STAR Key Program Indicators, 2000 and 2009

ENERGY STAR PROGRAM STRATEGY	KEY INDICATOR	YEAR OF RESULTS	
		2000	2009
Efficient Products (for more information, see p. 13)	Product Categories Eligible for ENERGY STAR	33	> 60
	Individual Product Models Qualifying	11,000	> 40,000
	Products Sold ^{1,2}	600 million	~ 3 billion ³
	Public Awareness	40%	> 75%
	Manufacturing Partners	1,600	~ 3,000
	Retail Partners	550	> 1,500
	EE Program Administrator Partners	100	> 700
Home Improvement (for more information, see p. 20)	Homes Improved through Home Performance with ENERGY STAR ¹	—	> 75,000
	EE Program Administrator Partners	—	> 30
	Homes Benchmarked using Yardstick ¹	—	310,000
New Homes (for more information, see p. 18)	Number of New Homes Built ¹	25,000	> 1,000,000
	Percent of National New Home Starts	< 1%	> 20%
	Markets with over 20% Market Share	0	> 20
	Builder Partners	1,600	> 8,500
Existing Commercial Buildings (for more information, see p. 22)	Number of Buildings Rated ¹	4,200	> 130,000
	Building Square Footage Rated ¹	800 million	~ 17 billion
	Percent of Commercial Square Footage Rated	1%	~ 25%
	Building Types Eligible for the ENERGY STAR Label	2	12
	Number of Buildings Labeled ¹	545	~ 9,000
	Building Square Footage Labeled ¹	128 million	~ 1.6 billion
New Commercial Buildings (for more information, see p. 23)	Number of Buildings Designed to Earn the ENERGY STAR ¹	—	230
Industrial Improvements (for more information, see p. 26)	Industrial Partners	—	> 600
	Industrial Sectors (and subsectors)	0	18
	Facility Types Eligible for the ENERGY STAR Label	—	8
	Number of Facilities Labeled ¹	—	54
Annual Results (for more information, see p. 51)	Energy Saved (kWh)	62 billion	204 billion
	Emissions Avoided (MMTCE)	15.8	46.3
	Net Savings (USD)	\$5 billion	\$17 billion

¹ Results are cumulative.

² The cumulative total of product sales across the entire ENERGY STAR program from 1992-2009, including those from the efforts of the U.S. Department of Energy. The results for energy saved and the resulting environmental and economic benefits represent EPA efforts alone.

³ Compact fluorescent bulbs are not included in the number of ENERGY STAR qualified products purchased.

— : Not applicable

~ : About

TABLE 6. ENERGY STAR Award Winners

To learn more about these award winners and their great accomplishments, see *Profiles in Leadership: 2010 ENERGY STAR Award Winners*.*

SUSTAINED EXCELLENCE

3M
St. Paul, MN

Advantage IQ, Inc.
Spokane, WA

APS (Arizona Public Service)
Phoenix, AZ

ArcelorMittal
Chicago, IL

Austin Energy
Austin, TX

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

CalPortland Company
Glendora, CA

CB Richard Ellis
Los Angeles, CA

CenterPoint Energy
Houston, TX

Council Rock School District
Newtown, PA

Energy Inspectors
Las Vegas, NV

Energy Trust of Oregon
Portland, OR

Food Lion, LLC
Salisbury, NC

Ford Motor Company
Dearborn, MI

GE Appliances & Lighting
Louisville, KY

Giant Eagle Incorporated
Pittsburgh, PA

Gorell Enterprises, Inc.
Indiana, PA

Gresham-Barlow School District
Gresham, OR

Hines
Houston, TX

ITW Food Equipment Group -
North America
Troy, OH

Ivey Residential, LLC
Evans, GA

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

The Joint Management Committee
representing Massachusetts
New Homes with ENERGY STAR
Lexington, MA

Lowe's Companies, Inc.
Mooresville, NC

Merck & Co., Inc.
Whitehouse Station, NJ

Nashville Area Habitat
for Humanity
Nashville, TN

National Grid
Waltham, MA

New York State Energy Research
and Development Authority
(NYSERDA)
Albany, NY

NewYork-Presbyterian Hospital
New York, NY

Northeast Energy Efficiency
Partnerships (NEEP)
Lexington, MA

Oncor
Dallas, TX

OSRAM SYLVANIA Inc.
Danvers, MA

Pacific Gas and Electric Company
(PG&E)
San Francisco, CA

Pella Corporation
Pella, IA

PepsiCo, Inc.
Purchase, NY

ProVia Door
Sugar Creek, OH

Raytheon Company
Waltham, MA

Rocky Mountain Power, Inc.
Salt Lake City, UT

SENERCON
El Paso, TX

Servidyne
Atlanta, GA

Southern California Edison
Company
Rosemead, CA

Southern Energy Management
Morrisonville, NC

Sponsors of Northwest Energy
Efficiency Alliance (NEEA)
Portland, OR

TIAA-CREF
New York, NY

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

TRANSWESTERN
Houston, TX

USAA Real Estate Company
San Antonio, TX

Whirlpool Corporation
Benton Harbor, MI

Winton/Flair Custom Homes
El Paso, TX

Wisconsin Focus on Energy
Madison, WI

PARTNER OF THE YEAR

Advanced Energy
Raleigh, NC

Andersen Corporation
Bayport, MN

Bosch Home Appliances
Huntington Beach, CA

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

CEMEX USA
Houston, TX

Colorado Governor's Energy
Office
Denver, CO

Energy Diagnostics Inc.
Valparaiso, IN

Energy Education
Dallas, TX

EnergyLogic
Berthoud, CO

Environments For Living/Masco
Home Services
Daytona Beach, FL

Evergreen Public Schools
Vancouver, WA

FetterGroup
Louisville, KY

Frostbusters & Coolth Co.
Grand Junction, CO

Gainesville Regional Utilities
(GRU)
Gainesville, FL

Georgia Power
Atlanta, GA

Good Earth Lighting, Inc.
Wheeling, IL

Hanesbrands Inc.
Winston-Salem, NC

HEI Hotels & Resorts
Norwalk, CT

Home Energy Defense
Lincoln, NE

JELD-WEN, inc.
Klamath Falls, OR

Johnson Controls, Inc.
Milwaukee, WI

Jones Lang LaSalle
Chicago, IL

Kennedy Associates
Seattle, WA

Kimberly-Clark Corporation
Dallas, TX

Kohl's Department Stores
Menomonee Falls, WI

Long Island Power Authority
(LIPA)
Uniondale, NY

Loudoun County Public Schools
Ashburn, VA

Louisville-Jefferson County
Metro Government
Louisville, KY

Manitowoc Foodservice
New Port Richey, FL

New Mexico Gas Company
Albuquerque, NM

Nissan North America, Inc.
Franklin, TN

Panasonic Home & Environment
Company
Secaucus, NJ

Public Service Company of New
Mexico (PNM)
Albuquerque, NM

Public Service Company of
Oklahoma (PSO)
Tulsa, OK

Puget Sound Energy
Bellevue, WA

Questar Gas Company
Salt Lake City, UT

Saint-Gobain
Valley Forge, PA

Sears Holdings Corporation
Hoffman Estates, IL

Sunoco, Inc.
Philadelphia, PA

Technical Consumer Products,
Inc.
Aurora, OH

ComEd
Chicago, IL

Community Housing Partners
Christiansburg, VA

Continental Refrigerator
Bensalem, PA

DIRECTV, Inc.
El Segundo, CA

HearthStone Homes, Inc.
Omaha, NE

Houston Habitat for Humanity
Houston, TX

KB Home
Los Angeles, CA

M/I Homes
Columbus, OH

Menards
Eau Claire, WI

Metro Lighting
St. Louis, MO

Nationwide Marketing Group
Winston-Salem, NC

On Top of the World
Communities, Inc.
Ocala, FL

PK Management, LLC
Richmond Heights, OH

Richmond American Homes
Denver, CO

Samsung Electronics Co., Ltd.
Suwon, South Korea

Sharp Electronics Corporation
Mahwah, NJ

Southern California Gas
Company
Los Angeles, CA

Southern Minnesota Municipal
Power Agency (SMMPA)
Rochester, MN

AWARDS FOR EXCELLENCE

Actus Lend Lease, LLC
Nashville, TN

City of Topeka Department
of Housing & Neighborhood
Development
Topeka, KS

*For more information, visit http://www.energystar.gov/ia/partners/pt_awards/2010_profiles_in_leadership.pdf.

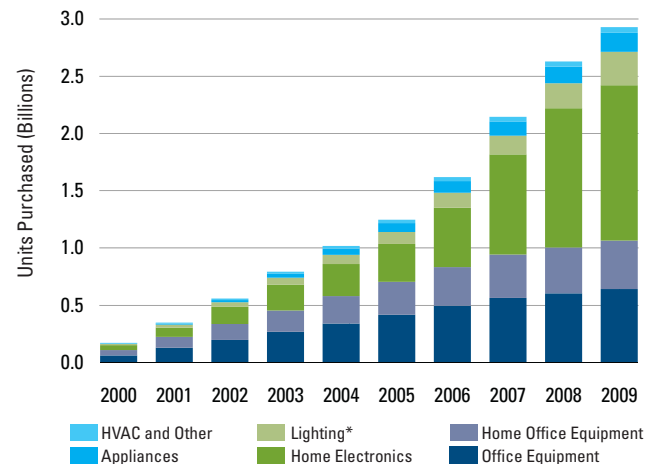
ENERGY STAR QUALIFIED PRODUCTS



The American public relies on ENERGY STAR as the national symbol for energy efficiency to guide their purchasing decisions, save them money, and protect the environment. In 2009, Americans purchased over 300 million products that have earned the ENERGY STAR—across more than 60 product categories—for a cumulative total of about 3 billion products⁶ purchased since 2000 (see Figure 5). ENERGY STAR qualified products offer consumer savings of as much as 75 percent relative to standard models. Key activities in 2009 included:

- Adding four new product categories and updating specifications for eight product categories (see Table 7, p.14).
- Maintaining the value of ENERGY STAR by monitoring and protecting the use of the label.
- Signing a new agreement with DOE designed to enhance and strengthen the trusted ENERGY STAR program.

FIGURE 5. About 3 Billion ENERGY STAR Qualified Products Purchased Since 2000



*Compact fluorescent bulbs are not included in the number of ENERGY STAR qualified products purchased.

Achievements in 2009

Empowering and Activating Consumers

EPA engages in public outreach that encourages Americans to make energy-efficient changes at home, at work, and in their communities. The ENERGY STAR program's approach highlights both the financial and environmental benefits of energy efficiency and provides a forum to drive behavior change through a variety of elements—reaching millions of people through print and broadcast media, events nationwide, and grassroots-to-national partnerships.

- The ENERGY STAR Pledge continued to serve as the cornerstone of the national Change the World, Start with ENERGY STAR campaign in 2009. Through the Pledge, EPA encourages individuals to take simple actions that can make a big difference in saving energy, such as:
 - Choosing ENERGY STAR qualified appliances and electronics.
 - Maintaining home heating and cooling systems to improve efficiency.

⁶ Compact fluorescent bulbs are not included in the number of ENERGY STAR qualified products purchased.

Table 7. ENERGY STAR Product Specifications Added, Revised, and In Progress

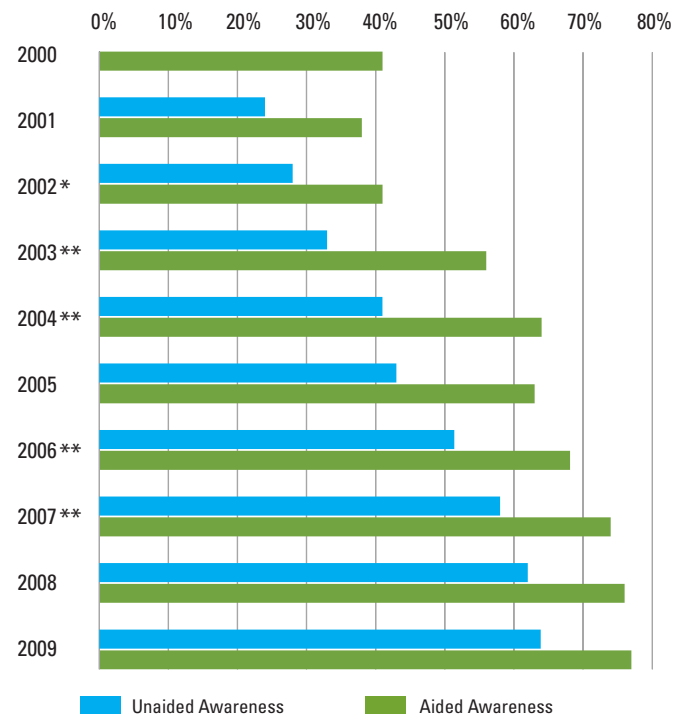
PRODUCT CATEGORY	YEAR INTRODUCED (AND REVISED)	ENERGY SAVINGS	STATUS OF ACTIVITY IN 2009
2009 NEW SPECIFICATIONS			
Commercial Griddles	2009	10-20%	New specification took effect May 8, 2009.
Commercial Ovens	2009	10-20%	New specification took effect May 16, 2009.
Integral LED Lamps	2009	75%	New specification to take effect August 31, 2010.
Servers	2009	30%	New specification took effect May 15, 2009.
2009 REVISIONS COMPLETED			
Audio/Video	1999 (2003, 2009)	60%	Revised specification to take effect July 30, 2010 and March 30, 2012.
Commercial Refrigerator/ Freezer	2001 (2009)	30%	Revised specification for glass door took effect April 1, 2009. Revised specification for solid door to take effect January 1, 2010.
Geothermal Heat Pump	1995 (2001, 2009)	45%	Revised specification took effect December 1, 2009.
Light Commercial HVAC	2002 (2004, 2009)	7-10%	Revised specification to take effect May 1, 2010.
Monitors/Displays	1992 (1995, 1998, 1999, 2005, 2006, 2009)	20%	Revised specification took effect October 30, 2009 for displays under 30 inches. Revised specification to take effect January 30, 2010 for displays between 30 and 60 inches.
Televisions	1998 (2002, 2004, 2005, 2008, 2009)	40%	Revised specification to take effect May 1, 2010 and May 1, 2012.
Ventilation Fans	2001 (2003, 2009)	60-70%	Revised specification took effect January 15, 2009.
Windows, Doors, and Skylights	1998 (2003, 2005, 2009)	7-15%	Revised specification to take effect January 4, 2010.
2009 REVISIONS IN PROGRESS			
Commercial Fryers	2003	25%	In progress, expected to be complete in 2011.
Hot Food Holding Cabinets	2003	25-65%	In progress, expected to be complete in 2010.
Servers	2009	TBD	In progress, expected to be complete in 2011.
Set-top Boxes	2001 (2005, 2008)	30%	In progress, expected to be complete in 2010.
Water Coolers	2000 (2004)	45%	In progress, expected to be complete in 2010.
NEW SPECIFICATIONS IN DEVELOPMENT			
Climate Controls		TBD	New specification to be completed in 2011.
Commercial Audio		TBD	New specification to be completed in 2010.
Data Center Storage		TBD	New specification to be completed in 2011.
Lab-grade Refrigerator/ Freezer		TBD	New specification to be completed in 2011.
Small Network Equipment		TBD	New specification to be completed in 2011.
Solid State Lighting Outdoor Luminaires		TBD	New specification to be completed in 2011.

- Ensuring homes are well sealed and insulated.
- Enabling power management features on home computers and monitors.
- More than 330,000 individuals took the ENERGY STAR Pledge, representing an estimated potential 1.6 billion GHG emissions prevented and almost 1 billion kWh potentially saved. Additionally, the campaign generated nearly 10 million media impressions from national and local media covering the overall campaign, events and the Exhibit House tour, and other product-related program developments.
- Change the World, Start with ENERGY STAR pledge drivers continued to be integral to the campaign's success. These companies and organizations encourage their employees, members, constituents, and others to take the ENERGY STAR Pledge to make energy-saving changes at home. The 2009 campaign included more than 800 pledge drivers, up from 743 the previous campaign year. Since Earth Day 2009, the organizations leading the way include Georgia Power Company, Jones Lang LaSalle, ComEd, Kentucky National Energy Education Development (NEED) Project, One Change's Project Porchlight campaign, and the U.S. Department of Defense.
- EPA activated more than 350,000 American youth and their families in 2009 by supporting energy efficiency projects in their communities, schools, and homes through campaign partnerships with Boys & Girls Clubs of

America (BGCA) and Parent-Teacher Organizations (PTO) Today (see below).

- More than 18,000 visitors in five cities toured the ENERGY STAR Exhibit House during the 2009 campaign. Featuring new interactive displays, the Exhibit House gave visitors the opportunity to learn about energy efficiency room by room.

FIGURE 6. Awareness of ENERGY STAR Growing in the United States



*Unaided annual result is statistically different from the result of the prior year.

**Aided and unaided annual results are statistically different from the results of the prior year.

Change the World, Start with ENERGY STAR Campaign

In 2009, EPA kicked off the second year of its Change the World, Start with ENERGY STAR campaign by opening the Exhibit House at the Earth Day 2009 event on the National Mall in Washington, DC. EPA Administrator Lisa P. Jackson announced new youth partnerships with BGCA and PTO Today as part of the event. She was joined by members of a local Boys & Girls Club who toured the ENERGY STAR Exhibit House and pledged to carry out specific energy efficiency actions to fight climate change.

For example:

- BGCA Clubs across the country conducted community service projects related to energy efficiency—ranging from home energy check-ups to community energy fairs—using ideas developed in conjunction with EPA.
- K-8 schools nationwide hosted “Go Green Nights” to teach and empower kids and their families about energy efficiency, based on event-planning kits developed by PTO Today and EPA.



The 2009 campaign built on the success of previous years and incorporated new elements to engage youth and connect personally with consumers. The combined efforts of the national campaigns since 2006 have generated more than 2.5 million pledges of individual actions that could prevent over 6 billion pounds of GHG emissions.

- The ENERGY STAR website experienced impressive growth; visitor sessions reached 16 million in 2009, a 45-percent increase over 2008.
- More than 75 percent of American households recognized the ENERGY STAR label (see Figure 6, p.15).⁷ Additionally, more than 80 percent of households had a high or general understanding of the label.
- One-third of American households knowingly purchased an ENERGY STAR qualified product, and about 80 percent of those households reported being favorably influenced by the ENERGY STAR label and/or likely to recommend ENERGY STAR products to their friends.⁸

Maintaining the Integrity of ENERGY STAR

ENERGY STAR for products has grown to encompass more than 60 categories and is used by millions of Americans to make energy-efficient choices that help them save money and protect the environment. The ENERGY STAR brand is a valuable asset, and like any asset with appreciable value, it must be properly used and protected to deliver on our promise to consumers. EPA and DOE undertake a broad range of efforts to ensure that:

- The ENERGY STAR name and marks are applied properly and consistently in the marketplace.
- ENERGY STAR delivers on its promise to designate products and services that protect the environment through superior energy efficiency without trade-offs in performance or functionality.
- The ENERGY STAR program is positioned to enjoy broad consumer confidence and deliver growing energy savings and related environmental benefits for years to come.

Monitoring the ENERGY STAR Brand

Product manufacturers and retailers enter into formal partnership agreements with the government and agree to adhere to the ENERGY STAR Identity Guidelines, which describe how the ENERGY STAR name and mark may be used. EPA continuously monitors the use of the brand in trade media, advertisements, the Internet, and stores. The Agency also conducts biannual onsite store-level assessments of ENERGY STAR qualified products on store shelves to ensure the products are presented properly to consumers. In addition, EPA evaluates the presence and quality of display materials that showcase the ENERGY STAR name and/or logo and assess retail staff knowledge and use of program information when assisting customers.

Enhancing Qualification and Verification Requirements

To ensure that ENERGY STAR remains a trusted symbol for environmental protection through superior efficiency, EPA and DOE are pursuing comprehensive enhancements for product qualification and verification. These new requirements will be effective for products seeking qualification by the end of 2010.

- All ENERGY STAR qualified products will be certified as meeting program requirements by an accredited third-party certification body for every product. Certification will include qualification testing before product labeling as well as post-market verification testing for a percentage of products to confirm that products continue to meet program requirements.
- All product testing will be conducted in EPA-recognized laboratories that provide evidence of technical competence, strong quality management processes, and impartiality toward test results.
- EPA will accept applications from accreditation bodies, laboratories, and certification bodies that wish to participate in the program. Requirements for EPA recognition of these organizations build upon international standards, including provisions that they demonstrate impartiality.

These improvements will ensure that customers get the energy and financial savings they expect when purchasing products that have earned the ENERGY STAR.

Enforcement

Taking action to enforce the proper use of the ENERGY STAR mark is essential to maintaining the integrity of the program. When logo use monitoring or verification testing confirms an ENERGY STAR labeled product model does not perform as specified, EPA disqualifies the model from the program, removes it from the list of qualified products, and requires the manufacturer to take corrective actions.

⁷ For more information, see U.S. EPA, 2010c.

⁸ For more information, see U.S. EPA, 2010c.

About ENERGY STAR Product Specification Revisions

When the ENERGY STAR program was established in 1992, EPA offered the label for two products—computers and monitors. Since then, the program has grown to include more than 60 product categories. Through the ENERGY STAR program, EPA provides value to consumers by enabling them to easily identify energy-efficient products. To achieve this, EPA sets specifications reflective of the performance of the most efficient products on the market. For a product to qualify for the ENERGY STAR label, it must meet a strict set of specifications designed to ensure that the product:

- Is energy-efficient
- Is cost-effective to the purchaser
- Maintains product performance or features

Revising ENERGY STAR Specifications

While EPA continues to expand its suite of labeled products, it also revises specifications on an ongoing basis to ensure that the ENERGY STAR label remains meaningful to consumers. Over the years, specifications for the majority of the product categories have been revised to

achieve additional energy savings (see Table 8). Each year, EPA reviews current product specifications and carefully considers the following questions to assess whether a specification revision is appropriate:

- Can significant additional energy savings be realized nationally?
- Can energy consumption and performance be measured and verified with testing?
- Can product or service performance be maintained or enhanced with increased energy efficiency?
- Will purchasers be able to recover an additional investment in increased energy efficiency within a brief period of time?
- Can additional energy efficiency be achieved without unjustly favoring one technology?
- Will ENERGY STAR labeling effectively differentiate products and services and be visible to purchasers?

EPA carefully weighs these questions to decide which products warrant specification revisions.

TABLE 8. EPA Maintains Efficiency Standards With More Than 135 Product Specifications and Revisions

PRODUCT TYPE	NUMBER OF PRODUCT CATEGORIES	TOTAL NUMBER OF SPECIFICATIONS (NEW AND REVISED)	SPECIFICATION UPDATES IN THE LAST 3 YEARS	SPECIFICATIONS THAT WENT INTO EFFECT IN 2009
Consumer Electronics	11	32	9	2
Office Equipment	10	36	11	2
HVAC	9	24	4	1
Commercial Food Service Equipment	9	10	6	3
Lighting	6	19	6	—
Building Envelope	3	10	2	—
Appliances	2	5	2	—
Other	3	7	2	—

What To Expect in 2010 and Beyond

- Expand the list of products that can earn the ENERGY STAR by adding commercial audio.
- Raise the bar on qualifying products by revising specifications to make them more stringent and efficient. EPA will finalize revisions for hot food holding cabinets, light commercial HVAC, set-top boxes, and water coolers.
- Work with DOE on further program enhancements, including broader product coverage, more frequent specification updates, and enhanced product testing and verification.

ENERGY STAR IN THE RESIDENTIAL SECTOR



In a June 2009 press release, President Barack Obama noted that "one of the fastest, easiest, and cheapest ways to make our economy stronger and cleaner is to make our economy more energy efficient."⁹ With energy use in the residential sector accounting for nearly 17 percent of all U.S. GHG emissions, helping Americans make energy-efficient choices at home can help protect our environment as well. Through ENERGY STAR, EPA offers homeowners, renters, and home builders useful tools and resources to help them increase the energy efficiency of the nation's housing stock. Program highlights for 2009 included:

- Passing the milestone of 1 million ENERGY STAR qualified homes built.
- Increasing the number of participating ENERGY STAR builder partners to more than 8,500. These builders constructed over 100,000 ENERGY STAR qualified homes, representing more than 20 percent of new home starts (see Figure 7).
- Retrofitting more than 23,000 homes through Home Performance with ENERGY STAR.
- Expanding the Home Performance with ENERGY STAR programs to include more than 1,000 participating contractors.

Achievements in 2009

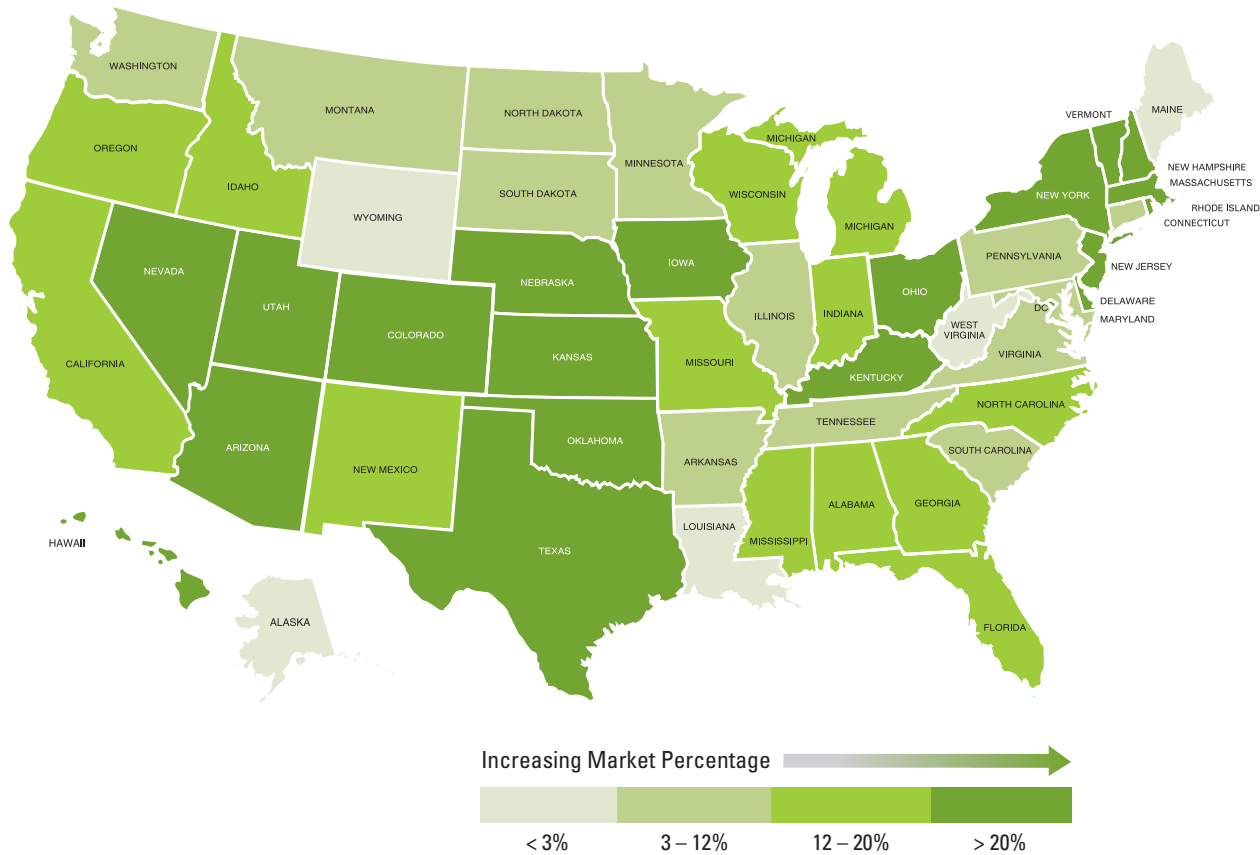
ENERGY STAR for New Homes

Celebrating 1 Million ENERGY STAR Qualified Homes. In 2009, EPA celebrated the milestone of 1 million ENERGY STAR qualified homes built (see Figure 8). Since EPA began labeling new homes in 1995, American homeowners have saved \$1.2 billion on their energy bills and reduced GHG emissions by 22 billion pounds. In 2009 alone, families living in ENERGY STAR qualified homes saved more than \$270 million on their utility bills, while avoiding GHG emissions equivalent to those from about 370,000 vehicles.

Offering Attractive Energy Efficiency Financing. EPA continued its collaboration with the Energy Programs Consortium, as well as with state energy offices and housing finance agencies (HFAs), to develop and launch the ENERGY STAR Mortgage Program. This program offers homeowners, including low-income homeowners, a way to purchase energy-efficient homes or finance efficiency improvements to their existing homes while receiving a financial benefit from the lender—usually in the form of a closing cost discount or reduced interest rate. Following a successful

⁹ For more information, see *The White House, 2009*.

FIGURE 7. ENERGY STAR Qualified New Homes Gaining Market Share

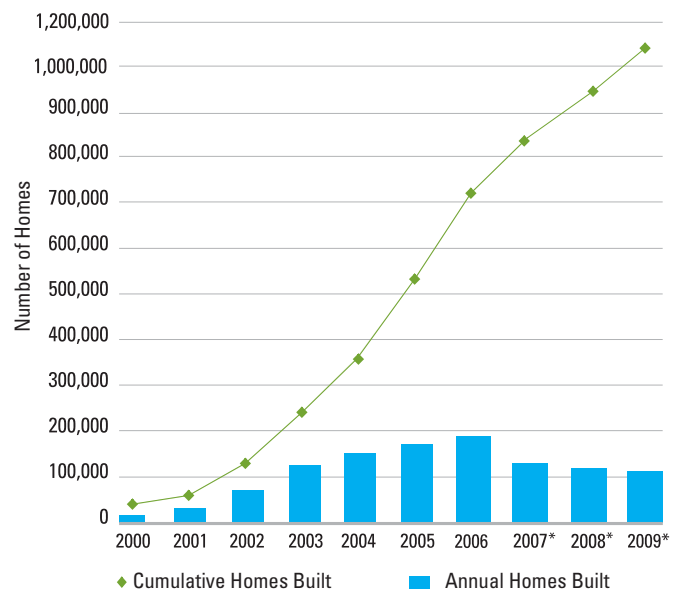


pilot in 2008, the ENERGY STAR Mortgage Program is off to a great start; in 2009, Maine and Colorado collectively provided more than 150 ENERGY STAR Mortgages to borrowers.

Making Affordable Housing More Energy Efficient. EPA continues to provide outreach and analytical support to state HFAs, helping them incorporate ENERGY STAR measures as part of the evaluation criteria for applications that request public funds to develop affordable rental housing for low-income families. At the end of 2009, over 40 state HFAs were giving preference to projects that included ENERGY STAR qualified products and/or residential new construction practices, while at least eight state HFAs required all new homes funded with low-income housing tax credits to be ENERGY STAR qualified. Based on data from the U.S. Department of Housing and Urban Development (HUD), more than 5,000 ENERGY STAR qualified homes were built in FY09 using public funding from HUD, other federal agencies, state/local agencies, or tax-exempt bond proceeds. EPA has also partnered with Habitat for Humanity’s U.S. affiliates to promote the construction of ENERGY STAR qualified homes. To date, over 400 Habitat affiliates have built more than 6,000 ENERGY STAR qualified homes. In addition, as a result of EPA’s outreach to the manufactured homes industry (also

part of the affordable housing market), more than 37,000 ENERGY STAR qualified manufactured homes have been built in the United States.

FIGURE 8. More than 1 Million Homes Nationwide Bear the ENERGY STAR Label



*Reflects transition to more stringent specification and slow down in U.S. housing starts.

ENERGY STAR Home Improvement

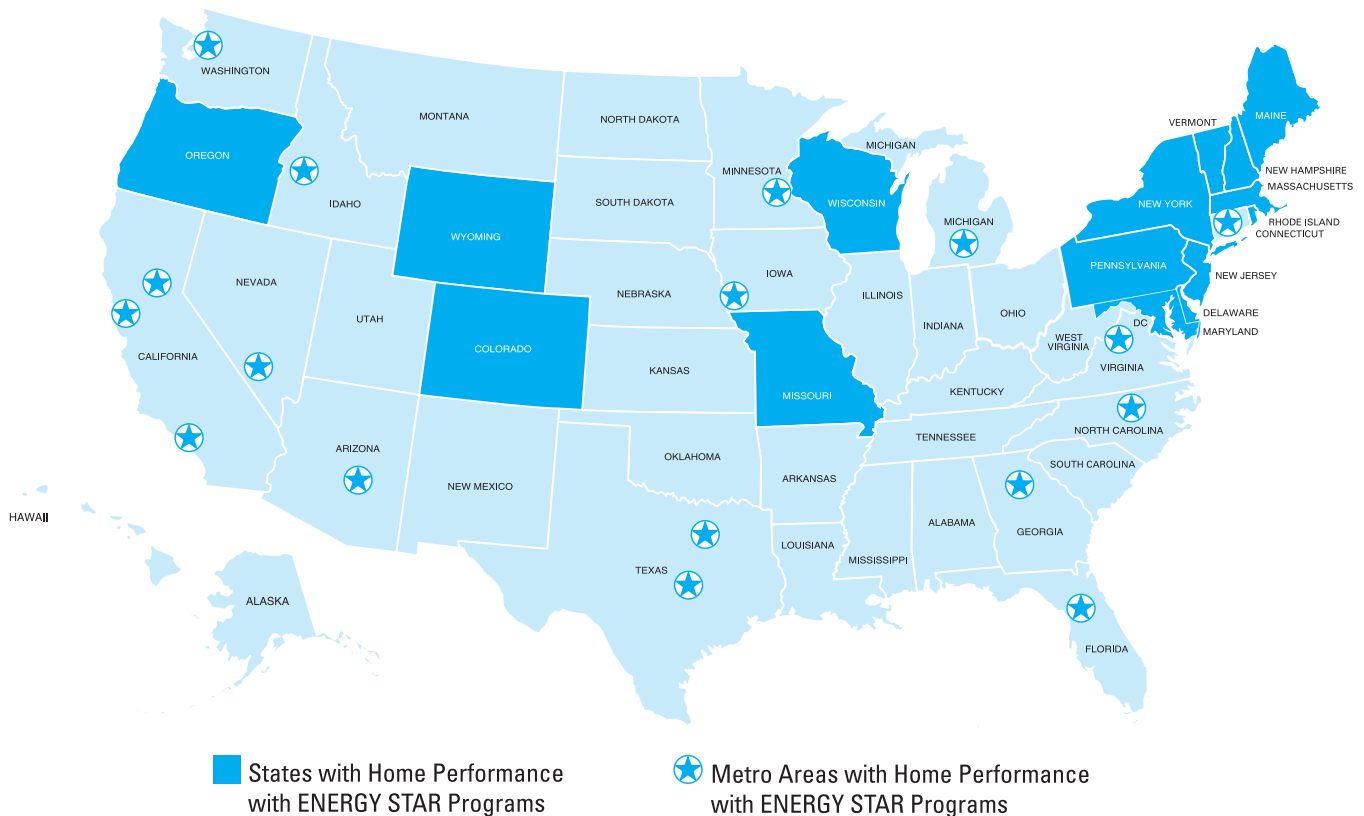
Expanding Home Performance with ENERGY STAR. Home Performance with ENERGY STAR (HPwES) offers homeowners a comprehensive, whole-house approach to energy efficiency improvements through a network of contractors trained to perform energy assessments and retrofits. Through regional HPwES sponsors, a third party conducts quality reviews of the contractors' work. Over the past 8 years, EPA has worked with sponsoring partners such as state and local governments, utilities, and nonprofit organizations to implement HPwES in more than 30 markets (see Figure 9). As a result of their efforts, by the end of 2009, over 75,000 homes had been retrofitted through HPwES programs. In 2009, EPA recognized 36 participating contractors with the ENERGY STAR Century Club Award for improving more than 100 homes each—up from 22 contractors in 2008.

Continuing Growth for ENERGY STAR HVAC Quality Installation Guidelines. EPA partnered with five utilities around the country to offer the ENERGY STAR HVAC Quality Installation (QI) program, which helps utility partners go

beyond product incentives to deliver additional KW and kWh savings by improving installation procedures. The HVAC QI program blends an American National Standards Institute (ANSI)-recognized, industry-accepted set of installation guidelines with the endorsement of EPA's ENERGY STAR program to help consumers obtain high-quality installations. Working with its partners, the HVAC QI program trained more than 100 contractors and saved homeowners over 100,000 kWh in 2009.

Offering Home Energy Online Assessment Tools. EPA updated the ENERGY STAR Home Energy Yardstick, a key home energy assessment tool, to allow users to set an energy reduction goal. By doing so, users can determine how their homes will compare to similar homes if they reduce their energy use by a certain percentage. The Home Energy Yardstick is just one of several tools, including the Home Energy Advisor, the ENERGY STAR Heating & Cooling Quiz, the *Guide to Energy Efficient Heating and Cooling*, and the *Do-It-Yourself Guide to Sealing and Insulating*, offered by EPA's ENERGY STAR program to help Americans improve their homes' energy efficiency.

FIGURE 9. Home Performance with ENERGY STAR Spreads Across the Country



What To Expect in 2010 and Beyond

New Homes

- Finalize new, more rigorous technical guidelines for homes to earn the ENERGY STAR. The new requirements will go into effect in 2011 and become fully implemented in 2012. EPA forecasts that market share for ENERGY STAR qualified homes will exceed 25 percent in 2010.
- Unveil the next generation of guidelines for cutting-edge builders through the ENERGY STAR Concept Home. A home constructed to these guidelines will be over 50 percent more efficient than the 2009 International Energy Conservation Code (IECC), making it compatible with renewable power systems that can result in net-zero energy consumption. The Concept Home is intended to road-test a bundle of advanced technologies likely to be considered in future ENERGY STAR new home specifications (2013 and beyond).
- Work with stakeholders to expand the ENERGY STAR Mortgage program to more states in 2010.

Existing Homes

- Expand HPwES retrofits. EPA forecasts that more than 30,000 additional homes will be improved through HPwES in 2010, bringing the total number of retrofitted homes nationwide to over 100,000.
- Launch more than 10 new HPwES programs in California, Delaware, Iowa, Nevada, Utah, Maryland, Illinois, and Kentucky.
- Recruit at least three new sponsors for the HVAC QI program in 2010.

ENERGY STAR IN THE COMMERCIAL SECTOR



As users of nearly 20 percent of the total energy consumed in the United States, commercial buildings play a vital role in the nation's effort to reduce energy consumption and GHG emissions.

EPA celebrated a decade of ENERGY STAR labeled buildings in 2009, signaling an important milestone in the Agency's efforts to use the ENERGY STAR program to drive efficiency in the nation's commercial buildings. This innovative program has helped bring thousands of organizations in the commercial buildings marketplace to the forefront of energy efficiency and climate stewardship.

From the first building that earned the ENERGY STAR in 1999, the number of ENERGY STAR labeled buildings grew to nearly 9,000 buildings by the end of 2009—representing nearly 1.6 billion square feet of space (see Figure 11, p. 24). The rapidly expanding use of the broad range of ENERGY STAR resources led to a banner year for ENERGY STAR—demonstrating that adoption of strategic energy management is good for business *and* the environment.

Achievements in 2009

Reaching Key Program Milestones

In 2009, with the help of ENERGY STAR, partners in the commercial sector made great strides in improving energy efficiency (see Figure 10). Major milestones involved:

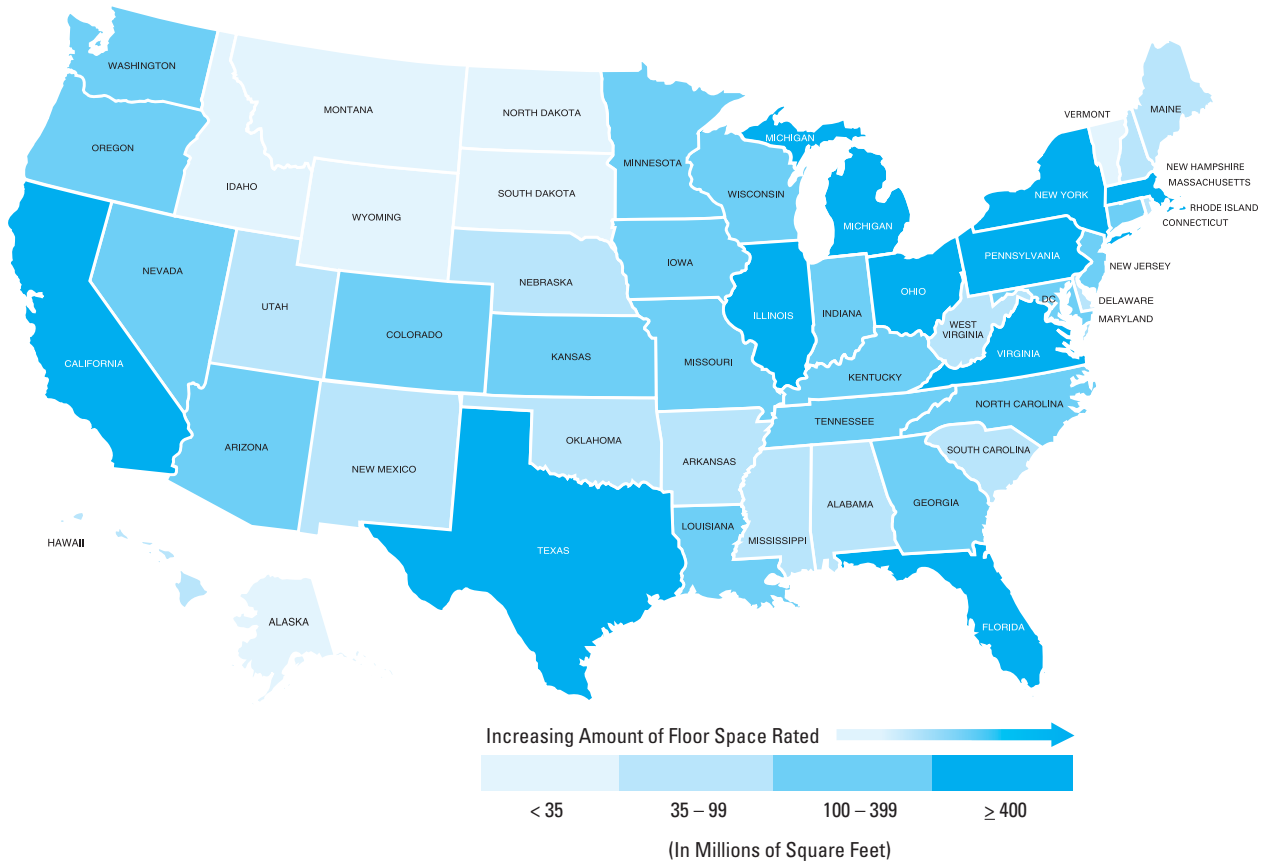
Tracking Energy Performance. By the end of 2009, the energy performance of more than 130,000 buildings had been assessed using EPA's Portfolio Manager. This cumulative total represents nearly 17 billion square feet, or nearly 25 percent of the total market, and signifies a strong commitment to energy management (see Figure 12, p. 24).¹⁰

Buildings Earning the ENERGY STAR. Almost 3,900 buildings earned the ENERGY STAR in 2009—more than any other

year—bringing the cumulative total to nearly 9,000 (see Figure 13, p. 25). In 2009, 35 percent of the buildings earning the ENERGY STAR had earned one or more labels in past years. Also in 2009, the first houses of worship to earn the ENERGY STAR label were welcomed into this select group of top performers.

Leading the Way in Saving Energy. Since 2004, more than 100 partners have been recognized as ENERGY STAR Leaders for reducing energy use in their buildings by as much as 40 percent or achieving top-performing portfolios. In 2009, almost 60 organizations—including the first two to qualify for a 40-percent reduction across their entire portfolio of buildings—earned recognition, the most ever in a single year.

¹⁰ Calculated using CBECS 2003, see EIA, 2006.

FIGURE 10. Amount of Rated Floor Space by State

More Buildings Designed to Earn the ENERGY STAR. Even with the downturn in the economy, nearly 100 commercial building design projects achieved Designed to Earn the ENERGY STAR in 2009, bringing the total number of buildings intended to operate at ENERGY STAR performance levels when they are built to 230.

Strategizing for Success

Implementing comprehensive energy retrofits in buildings and ensuring newly constructed buildings deliver on their high-performance intent requires organizations to commit to a superior energy management strategy at the top levels of management. Through ENERGY STAR, EPA packages actionable guidance for organizations to gauge the performance of all of their buildings easily and to prioritize cost-effective investment opportunities, learn best practices from industry leaders, and verify the savings from their actions. Adopting this strategy has proven to be a key ingredient to continuous improvement. In 2009, EPA focused on the following strategies to penetrate the commercial market on a greater scale and achieve new successes.

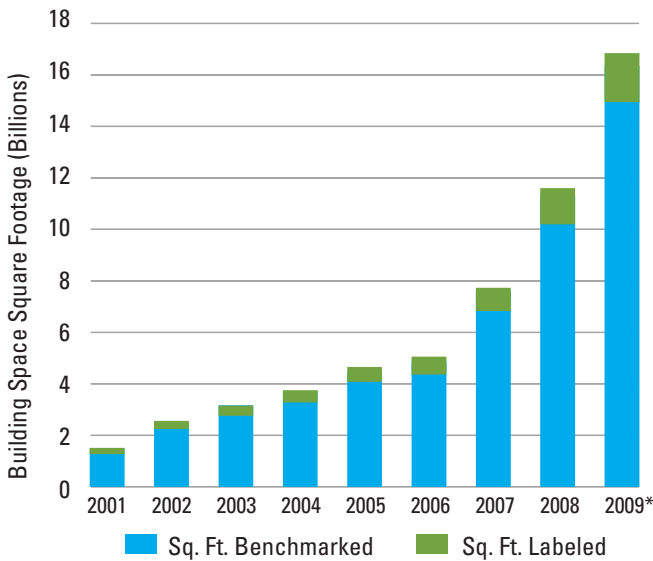
Supporting Innovative Energy Efficiency Initiatives. In 2009, strategic partnerships with state and local governments and industry associations resulted in the launch of several new initiatives that are quickly becoming nationwide models. Building on each organization's strengths—with EPA bringing objective energy metrics and a platform to educate and train energy users through the ENERGY STAR program—these partnerships resulted in a bold ramp-up of energy efficiency activity. For example:

- The Kilowatt Crackdown contest model has proven to be effective in motivating energy efficiency improvements using ENERGY STAR resources. The City of Louisville launched its second annual competition in 2009, and other local governments kicked off their own campaigns, including Chicago's Green Office Challenge, San Francisco's 24x7 Energy Challenge, and Portland's Office Energy Showdown.
- The State of Washington and New York City enacted legislation in 2009 requiring certain public and privately owned commercial buildings to be benchmarked using Portfolio Manager, joining Washington, DC; Austin, TX; West Chester, PA; and the State of California.

Linking to Experts. Service and product providers, architects, engineers, state energy offices, and utilities offer valuable energy efficiency services and programs to help identify, prioritize, and implement quality projects. In 2009, these organizations expanded their services to include more ENERGY STAR resources. This led to a 60-percent increase in energy benchmarking through automated benchmarking services for clients and assistance with labeling more than 1,500 buildings as ENERGY STAR.

To help building owners find experts with a successful track record of providing assistance to organizations in meeting their strategic energy management goals, EPA added requirements for service and product providers interested in becoming ENERGY STAR partners. Starting in 2009, a company had to demonstrate that it had experience benchmarking or labeling buildings to become an ENERGY STAR service and product provider partner.

FIGURE 11. Steady Growth in Building Space Benchmarked and Labeled

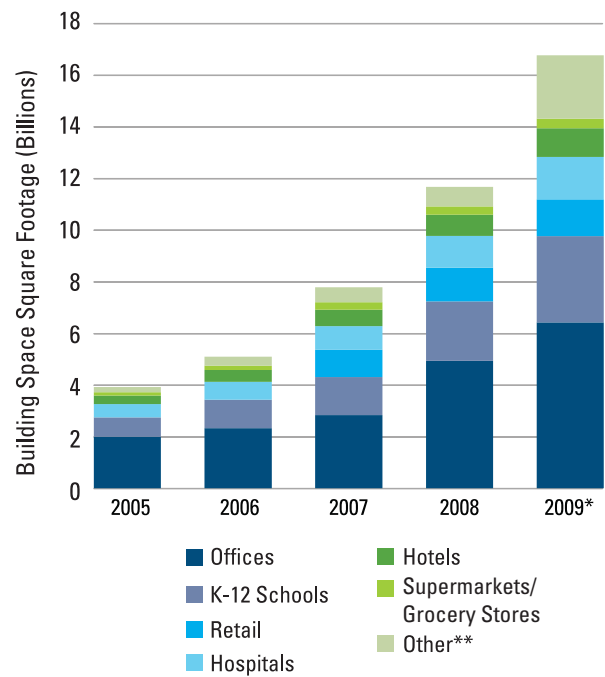


*2001-2008 includes only buildings eligible to receive an ENERGY STAR performance score. 2009 includes those buildings as well as buildings eligible to receive an EUI (Energy Use Intensity).

Expanding Portfolio Manager. EPA continues to expand Portfolio Manager’s capabilities to facilitate its continued use for tracking, understanding, and reducing the energy use of buildings, and to meet changing market needs for energy use information. Key improvements and expansions in 2009 involved:

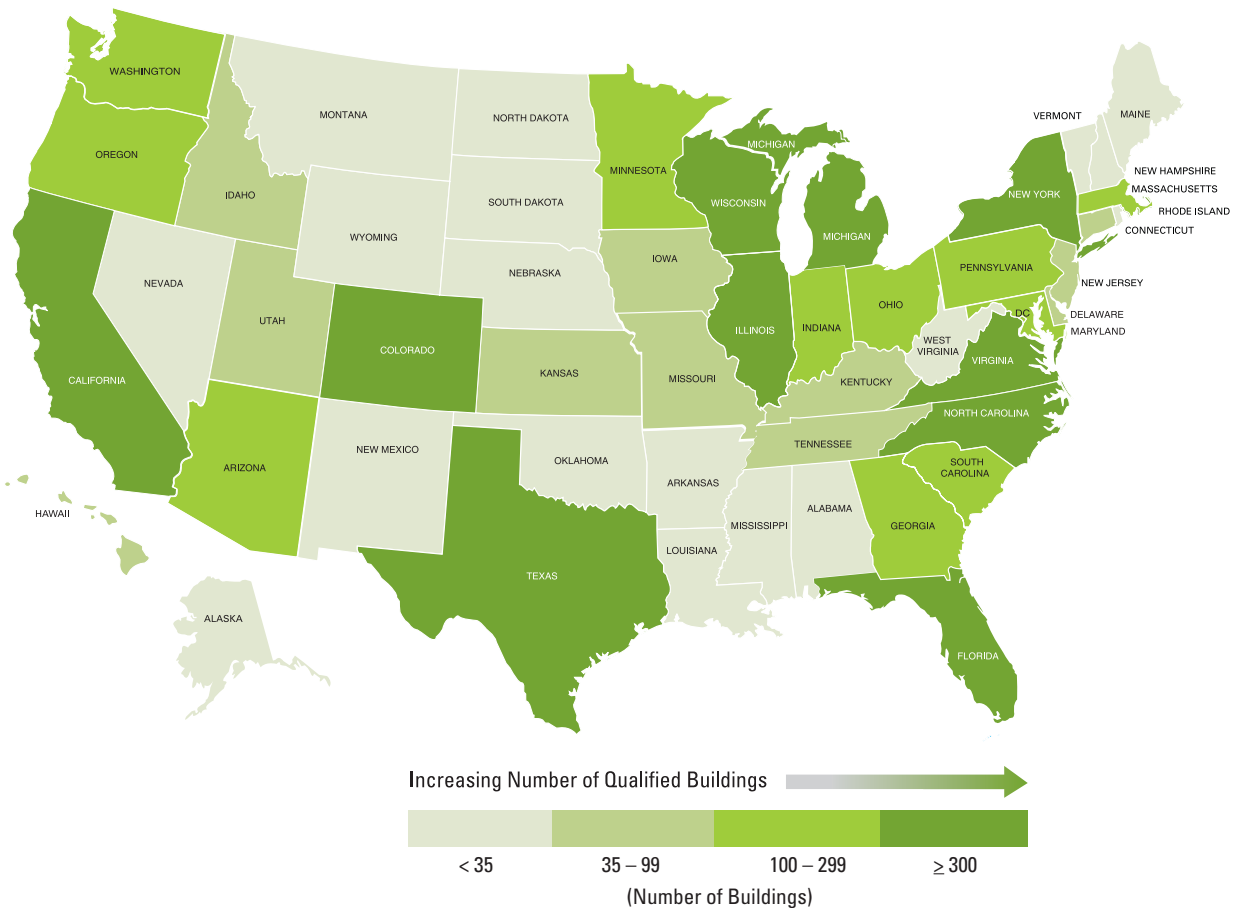
- Adding reporting features that enable users to access and customize reports on the information they are tracking in the tool.
- Incorporating onsite renewable energy generation into emissions and rating calculations.
- Developing and supporting automated utility data transfer projects with utilities and other information service providers.

FIGURE 12. Increase in Benchmarked Space by Building Type



*2001-2008 includes only buildings eligible to receive an ENERGY STAR energy performance score. 2009 includes those buildings as well as buildings eligible to receive an EUI (Energy Use Intensity).

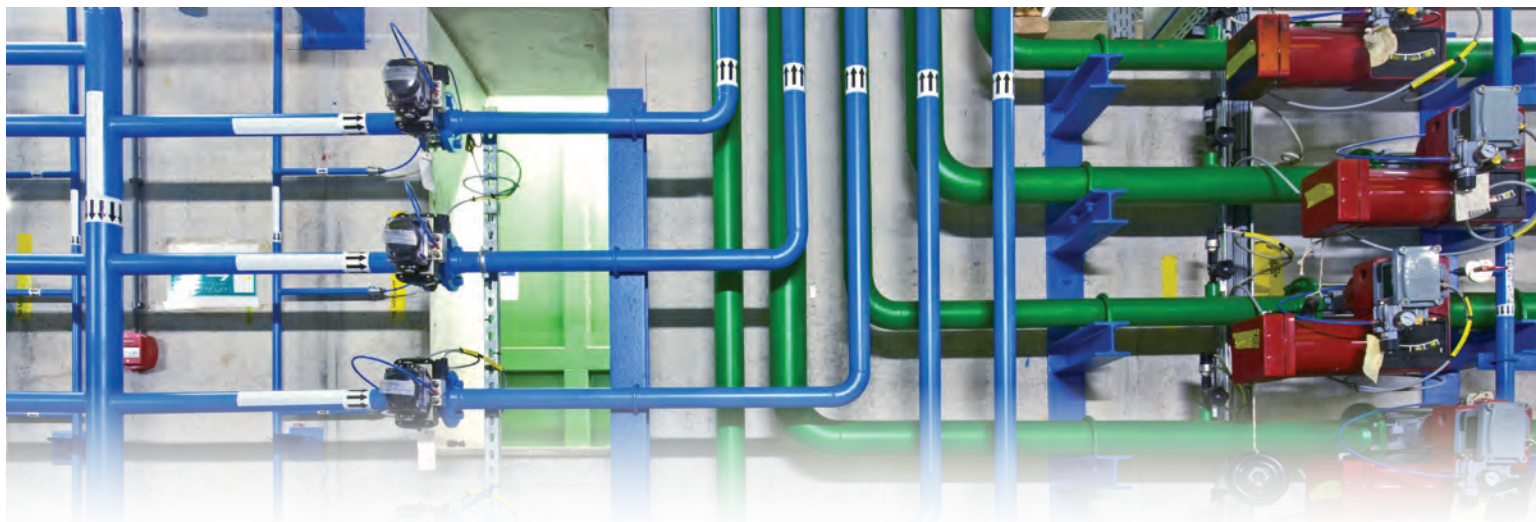
**Includes Bank-Financial Institutions, Warehouses/Storage, Courthouses, Medical Offices, Residence Halls, Clinic/Other Outpatient Health, College/University Convenience Stores, Distribution/Shipping Centers, Education, Entertainment/Culture, Fast Food, Fire Station/Police Station, Food Sales, Food Service, Health Care: Inpatient, Health Care: Long Term Care, Health Care: Outpatient, Library, Lodging, Mall, Multifamily Housing, Other, Public Assembly, Public Order and Safety, Recreation, Restaurant/Cafeteria, Retail (Misc.), Self-Storage, Service (Vehicle Repair/Service, Postal Service), Social/Meeting, Storage/Shipping/Non-Refrigerated Warehouse.

FIGURE 13. Nearly 9,000 Buildings Have Earned the ENERGY STAR

What To Expect in 2010 and Beyond

- Extend the ENERGY STAR label to data centers, providing an important assessment and recognition tool for a critical and growing source of energy consumption in the nation.
- Launch the first-ever National Building Competition, a coast-to-coast contest among commercial buildings to save energy and fight climate change. The competition will feature 14 commercial buildings from across the country that will "work off the waste" through improvements in energy efficiency with support from EPA's ENERGY STAR program.
- Launch a Building Performance with ENERGY STAR pilot with the help of utilities and state energy efficiency programs. The pilot program aims to help business customers further improve commercial building energy efficiency and achieve increased energy savings by strategically pursuing whole-building energy improvements.
- Collaborate with DOE to bring the resources of ENERGY STAR to state and local governments receiving funding under the American Recovery and Reinvestment Act of 2009 (ARRA) to improve energy efficiency in their communities.

ENERGY STAR IN THE INDUSTRIAL SECTOR



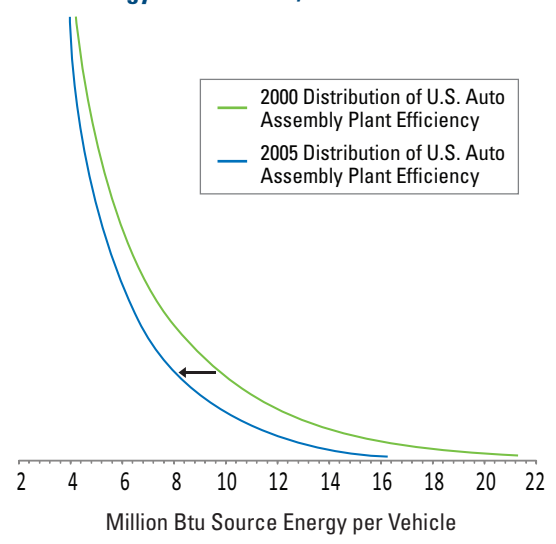
The industrial sector is currently responsible for 29 percent of the nation's annual GHG emissions. Through ENERGY STAR, EPA empowers industry to improve energy efficiency and prevent GHG emissions by eliminating barriers to energy management. EPA provides tools to manage and measure real improvement, including a plant energy performance indicator (EPI) for gauging plant energy efficiency on a national basis within an industry sector. Measuring improvement is the cornerstone of the ENERGY STAR program. The success of the ENERGY STAR Focus Industries in improving energy performance validates that EPA's strategic energy management approach—particularly the importance of measuring performance and recognizing top performance—is achieving results for the environment.

Sharing information within an industry has helped remove communication barriers related to energy efficiency and proven to be a highly successful approach. For example, EPA began work with the first ENERGY STAR Focus industry, motor vehicle manufacturing, in 2001. Industry partners applied ENERGY STAR resources and regularly measured energy efficiency of their auto assembly plants using the EPI. EPA conducted a second benchmarking of energy performance of U.S. auto assembly plants using data from 2005 as part of the regular update process for the EPI. This second benchmarking revealed a dramatic improvement in energy efficiency across the industry.

- While the energy performance of the industry's top plants has improved, the range of energy performance for all assembly plants has also narrowed, so that both high and low performing plants gained efficiency (see Figure 14).
- Fuel use has improved by 12 percent.
- Energy savings over 5 years translate into a reduction in CO₂ emissions of nearly 1.5 billion pounds annually.

The motor vehicle industry serves as an example of how industry-specific energy management strategies can help reduce emissions that contribute to climate change.

FIGURE 14. Improvement in U.S. Auto Assembly Plant Energy Performance, 2000 – 2005



Achievements in 2009

Informing and Empowering Energy Performance

EPA works closely with specific sectors to institute robust energy programs, provide sector-wide energy management tools, and implement best practices (see Table 9).

New plant EPIs issued. With the goal of enabling industry to overcome the lack of objective measurement methods, EPA released final EPIs for frozen fried potato plants and juice manufacturing plants. Draft EPIs were issued for industry testing for pulp and paper mills, steel plants with electric arc furnaces, and biscuit and cracker bakeries in 2009. At the same time, a revision of the baseline data for the existing cement plant EPI was released for industry testing.

New energy guides released. EPA issued an energy guide that identifies energy efficiency opportunities for pulp and paper plants, while a draft guide was released for the steel industry to review.

Building Capacity

Key alliances and tools help EPA and its partners build capacity in a cost-effective manner.

Number of industrial sector focuses grows to 18. EPA signed a Memorandum of Understanding with the American Foundry Society to enable more than 800 U.S. metalcasting companies to develop strategic energy management programs using ENERGY STAR resources.

Table 9. EPA ENERGY STAR Industrial Focuses on Energy

FOCUS INDUSTRY	PEER EXCHANGE NETWORK	INDUSTRY ENERGY GUIDE	ENERGY PERFORMANCE INDICATOR
Cement Manufacturing	●	Published	2 nd Version in Draft
Corn Refining	●	Published	Released
Food Processing			
• Cookies & Crackers			Draft
• Juice	●	Published	Released
• Potato Products			Released
• Tomato Products			Draft
Glass Manufacturing			
• Fiberglass	●	Published	Draft
• Flat Glass Products			Released
• Container Glass Products			Released
Metal Casting	●	Under Study	Exploring Options
Motor Vehicle Manufacturing	●	Published	2 nd Version Released
Petrochemical Manufacturing	●	Published	Draft
Petroleum Industry	●	Published	Private system recognized by EPA
Pharmaceuticals	●	Published	Released
Pulp & Paper			
• Integrated	●	Published	Draft
• Pulp			Draft
Steel			
• Mini-mills	●	In process	Draft
Water/Wastewater	●	In process	Released

TABLE 10. EPA Expands ENERGY STAR for Superior Energy Management of Industrial Plants

SECTOR FACILITY	LABELS EARNED IN 2009	TOTAL PLANTS EARNING LABELS
Cement Manufacturing Plants	10	20
Auto Assembly Plants	9	15
Petroleum Refineries	3	8
Wet Corn Mills	0	3
Pharmaceutical Manufacturing Plants	5	5
Frozen Fried Potato Processing Plants	3	3
Total Plants Labeled	30	54
Total Estimated Energy Savings (Compared with Average Plants)	38,700,000 mmBtu	156,400,000 mmBtu*

*Represents cumulative savings for labels earned since 2006.

More tools available to help small- and medium-sized manufacturers. EPA released a new Energy Tracking Tool that enables small- and medium-sized manufacturers to monitor energy use and intensity, set goals, and track energy performance.

Energy management best practice networking among partner companies increases. Networking among ENERGY STAR partner organizations increased by 30 percent over 2008 participation.

More Plants Earning the ENERGY STAR

EPA awarded the ENERGY STAR to 30 plants in 2009—including five pharmaceutical plants and three frozen fried potato plants that earned the ENERGY STAR for the first time—bringing the total to 54 (see Table 10). Since 2006, EPA has awarded the ENERGY STAR to plants meeting strict energy and environmental performance guidelines.

Expanding Sustainable Strategies

EPA is reaching beyond its ENERGY STAR partners by promoting energy efficiency as part of the partners' broad sustainability initiatives.

Supply chain engagement reaches beyond partners. EPA continued collaborating with the growing Supply Chain Working Group to promote the use of energy efficiency among the suppliers to ENERGY STAR partners. As a result, suppliers from several levels upstream are now engaged in ENERGY STAR.

Downstream industries. In 2009, the Cement Focus expanded to engage rock product industries downstream of the cement industry. Many U.S. cement producers that work with rock product industries, such as ready-mixed concrete, asphalt paving, and aggregates, are actively engaging these companies and regional associations in a broader ENERGY STAR focus on energy efficiency in rock product industries.

What To Expect in 2010 and Beyond

- Formalize agreements with more U.S. industrial sectors, including the dairy industry and concrete producers.
- Finalize EPIs for cement plants and biscuit and cracker bakeries.
- Complete an energy guide for steel plants and draft a guide for foundries.
- Analyze and measure the impact of energy management in the U.S. cement industry over a 10-year period through a rebenchmarking of cement plants.
- Collaborate with DOE on the development of an ISO standard for energy management and support the joint DOE-EPA State Energy Efficiency Action Network for industry.
- Engage small- and medium-sized manufacturing plants in setting and achieving energy performance goals through the ENERGY STAR Challenge for Industry.

CLIMATE LEADERS



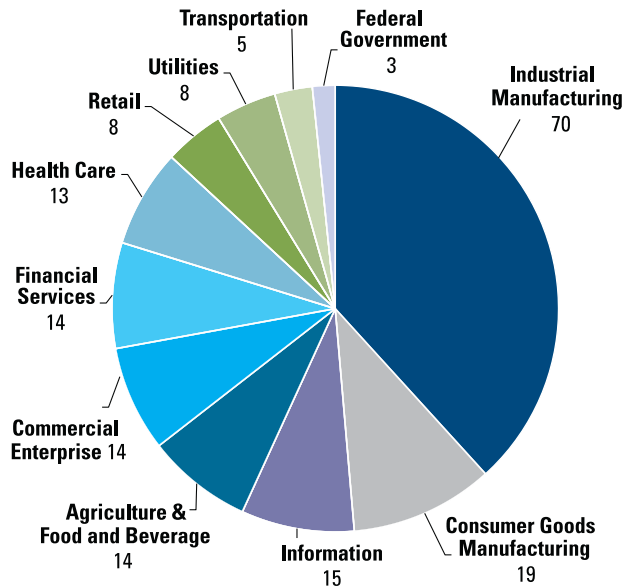
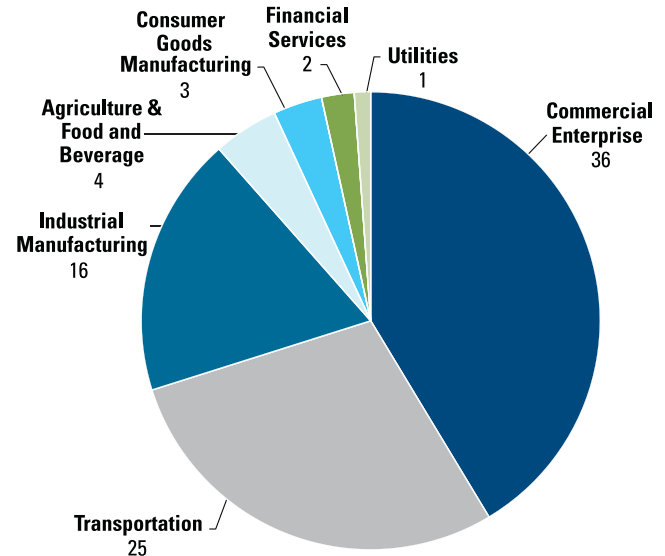
Launched in 2002, EPA's Climate Leaders program is an industry-government partnership that works with companies to develop comprehensive climate change strategies. Through Climate Leaders, EPA deploys standardized GHG emissions management practices for use among companies within an industry and provides guidance and recognition to encourage companies to take corporate-level action to reduce emissions. Climate Leaders partners represent a variety of industries and sectors, from manufacturers and utilities to financial institutions and retailers—with operations in all 50 states (see Figures 15 and 16, p. 30). When companies partner with Climate Leaders, they fight climate change by submitting a corporate-wide inventory of their GHG emissions and setting and achieving aggressive, public, emissions reduction goals.

Leveraging EPA's expertise and broad array of tools and resources, partners make informed decisions about cost-effective strategies, investments, and clean energy options to reduce their GHG emissions. EPA continually tracks partners' progress toward meeting their emissions goals and ensures the credibility of reported data by performing detailed reviews and making site visits. By participating in Climate Leaders, partners create a credible record of their accomplishments and receive EPA recognition as corporate environmental leaders.

Since its inception, Climate Leaders has reached a number of important milestones and is positioned to continue this success in the future (see Table 11, p. 30). EPA estimates that the GHG emissions reduction goals set by Climate Leaders partners will reduce GHG emissions by 47.5 MMTCE between 2005 and 2012, equivalent to preventing the annual GHG emissions from 33 million vehicles.

Achievements in 2009

- Eleven additional partners achieved Climate Leaders GHG reduction goals: Anheuser-Busch Companies, Inc.; Bank of America Corp.; Coors Brewing Company; Eastman Kodak Company; Exelon Corp.; First Environment, Inc.; Gap Inc.; Public Service Enterprise Group (PSEG); Raytheon Co.; Roche Group U.S.; and Shaklee Corp.
- Of the 29 companies that met their initial goals in the program, 19 thus far have committed to a second round of reduction goals.
- Thirty-eight partners announced initial corporate GHG reduction goals in 2009, bringing the total number of corporate GHG goals set by Climate Leaders partners to 154.

FIGURE 15. The 183 Climate Leaders Partners**FIGURE 16. Climate Leaders Small Business Network Members****TABLE 11. Climate Leaders Key Program Indicators for 2004 – 2009 (Cumulative)**

CLIMATE LEADERS INDICATOR	2004	2005	2006	2007	2008	2009
Partners	64	78	107	155	251	183*
Small Business Network Members (forthcoming)	—	—	—	—	—	87*
Total Partners and Members	—	—	—	—	—	270
Initial Inventories Submitted	42	58	78	115	161	201
Site Visits	9	29	46	77	109	144
Goals Announced	20	31	55	88	115	154
Goals Achieved	0	5	8	11	18	29

*In late 2009, EPA approved development of the Climate Leaders Small Business Network to provide support to smaller companies. In previous years, the program numbers reflect participation from both small and large companies. These 2009 numbers differentiate between the small and large companies participating in Climate Leaders.

What To Expect in 2010 and Beyond

- Refine program requirements, whereby participating companies must set absolute GHG reduction goals instead of electing to set only intensity-based targets.
- Make Climate Leaders partners' aggregate corporate-wide GHG inventories publicly available.
- Release emissions guidance for production of aluminum, cement, and pulp and paper, as well as updated versions of EPA sector-specific guidance on iron and steel production, hydrofluorocarbon (HFC) and perfluorocarbon (PFC) emissions from manufacturing refrigeration and air conditioning equipment, and municipal solid waste landfills. Guidance for optional sources, such as emissions associated with corporate meetings and conferences, will also be released.
- Launch the Climate Leaders Small Business Network to provide smaller companies with tools, resources, technical assistance, and public recognition for setting and achieving public GHG reduction goals.

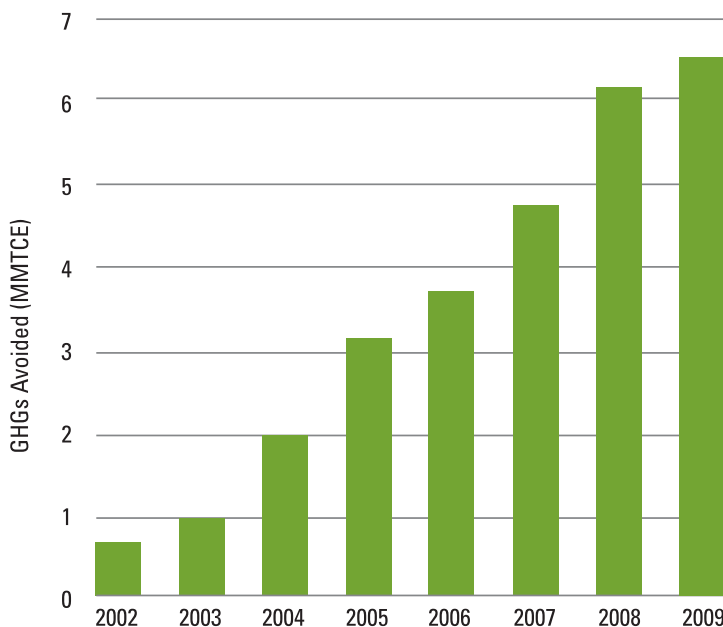
CLEAN ENERGY SUPPLY PROGRAMS



Since the debut of EPA's Clean Energy Supply Programs in 2001—which include the Green Power Partnership and the Combined Heat and Power (CHP) Partnership—remarkable progress has been made in facilitating the growth of green electricity generation and environmentally beneficial CHP across the nation. For the past 8 years, both programs have dismantled market barriers by helping hundreds of partners find cost-effective solutions to meet their energy needs through technical resources, nationally accepted standards, access to expertise, and recognition for environmental leadership.

Partner investments in clean energy yield significant environmental benefits by reducing GHG emissions and other air pollutants; their investments also transform the marketplace by increasing demand for clean energy supply technologies. The programs' achievements have been impressive; in 2009 alone, EPA's Clean Energy Supply programs reduced GHG emissions by 6.5 MMTCE (see Figure 17).

FIGURE 17. GHG Emissions Avoided by EPA's Clean Energy Supply Programs



GREEN POWER PARTNERSHIP

EPA's Green Power Partnership is a voluntary program that encourages organizations to buy green power as a way to reduce the environmental impacts associated with purchased electricity use while demonstrating environmental leadership. EPA's



Green Power partners include a wide variety of leading organizations, such as Fortune 500 companies; small- and medium-sized businesses; local, state, and federal government agencies; and colleges and universities. Once again, the commitments of these partners made 2009 an exceptional year for EPA's Green Power Partnership.

Achievements in 2009

- Added over 300 new partners, bringing the total to more than 1,200. These organizations have committed to buying more than 17 billion kWh of green power annually, which is enough energy to run nearly 1.5 million average American homes for one year (see Figure 18).
- Expanded EPA's Fortune 500 Green Power Challenge, an initiative focused on expanding the collective green power purchases of eligible Fortune 500 corporations. By the end of 2009, 60 Fortune 500 companies had taken the Challenge and stepped up their commitment to environmental stewardship by collectively purchasing more than 9 billion kWh.
- Acknowledged 44 participating partners in EPA's College & University 2008 – 2009 Green Power Challenge. EPA ranked the green power purchases of individual schools against others within their athletic conference, and then calculated cumulative purchases among competing athletic conferences.
- Presented 17 Green Power Leadership Awards to top purchasers of green power and onsite renewable power systems (see Table 12).

What To Expect in 2010 and Beyond

- Expand community-level green power purchasing by designing and launching a specific initiative to double the number of Green Power Communities nationwide.
- Explore innovative solutions that address the market barriers potentially impeding the deployment of onsite renewable energy systems by piloting at least one multi-stakeholder collaborative procurement.
- Continue to support and recognize partners' green power purchases while working with green power suppliers to increase the market supply of attractive green power products.
- Increase the number of partners by 15 percent in 2010.

TABLE 12. EPA Recognizes 17 Leading Green Power Partners in 2009

Green Power Purchasing

Beaulieu Commercial	<i>Adairsville, GA</i>
Bloomberg LP	<i>New York, NY</i>
EarthColor, Inc.	<i>West Orange, NJ</i>
Foulger-Pratt Management, Inc.	<i>Rockville, MD</i>
Motorola, Inc.	<i>Schaumburg, IL</i>
Neenah Paper, Inc.	<i>Neenah, WI</i>
Shaklee Corporation	<i>Pleasanton, CA</i>
Steelcase USA	<i>Grand Rapids, MI</i>
The Joinery	<i>Portland, OR</i>
Western Pennsylvania Energy Consortium	<i>Pittsburgh, PA</i>

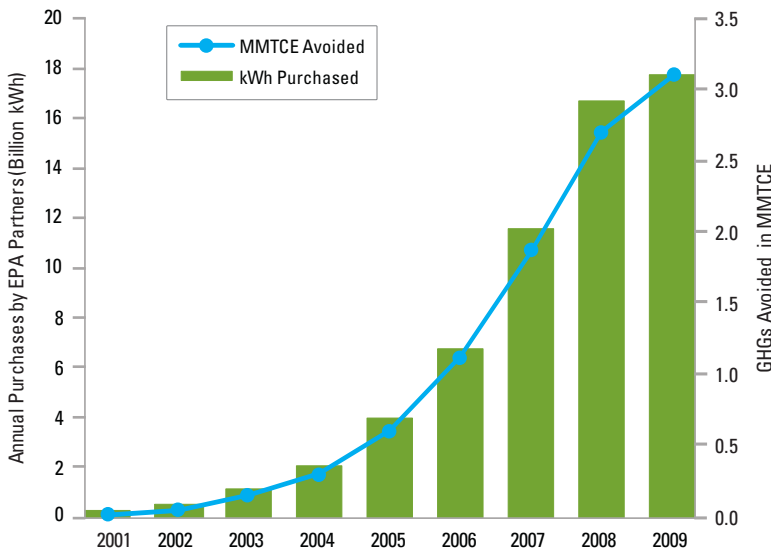
Onsite Generation

Applied Materials, Inc.	<i>Santa Clara, CA</i>
Butte College	<i>Oroville, CA</i>
Wal-Mart Stores, Inc. / California and Texas Facilities	<i>Bentonville, AR</i>

Green Power Partner of the Year

Deutsche Bank AG	<i>New York, NY</i>
Intel Corporation	<i>Santa Clara, CA</i>
Kohl's Department Stores	<i>Menomonee Falls, WI</i>
Mohawk Fine Papers, Inc.	<i>Cohoes, NY</i>

FIGURE 18. Green Power Purchases and Avoided GHG Emissions



Green Power—Energizing Communities Across the Country

Leading municipalities across the nation are partnering with EPA to become Green Power Communities (GPCs). GPCs are towns, villages, cities, counties, or Native American tribes in which the local government, businesses, and residents collectively buy green power in amounts that meet or exceed EPA's Green Power Partnership community purchase requirements. Since 2004, nearly 30 communities have mobilized to reduce their carbon footprint by buying and using green power. These purchases helped avoid the annual CO₂ emissions equivalent to those from the electricity use of nearly 58,000 average American homes.

COMBINED HEAT AND POWER PARTNERSHIP

Through the CHP Partnership, EPA encourages the use of high-efficiency CHP technologies, which are cleaner than separately produced electrical and thermal energy. CHP projects are up to 30 percent more efficient than traditional separate heat and power generation,¹¹ and can also reduce reliance on grid-supplied electricity, increase reliability of existing electricity supply systems, and help delay the need to build new capacity.



To promote increased utilization of CHP, EPA works closely with energy users, the CHP industry, state and local governments, and other stakeholders to develop new CHP projects and to promote their environmental, economic, and other benefits. Since the program's inception, the CHP Partnership has made an important impact on U.S. CHP capacity, annually assisting up to 71 percent of the new CHP capacity additions over the past 5 years (see Table 13).

Achievements in 2009

- Welcomed 89 new partners, bringing the total to 353. Provided technical assistance to 16 candidate sites across the country, including those in the municipal, utility, biofuels, industrial, and commercial sectors.
- Assisted in the deployment of more than 295 MW of new CHP nationwide (out of total new nationwide capacity of more than 450 MW), bringing the cumulative impact of the program to over 4,800 MW of new CHP.
- Recognized seven highly efficient CHP projects with the ENERGY STAR CHP Award. These systems range from a 0.2 MW dairy farm system to a 449 MW facility that supports a large plastics manufacturing plant (see Table 14, p. 34).
- Released the final proposed Waste Energy Recovery Rule on July 23, 2009, and solicited public comments.

TABLE 13. CHP Capacity Market Share

YEAR	TOTAL NEW CHP CAPACITY (MW)	NEW CHP CAPACITY CREDITABLE TO THE CHP PARTNERSHIP (MW)
2002	5,214	620 (12%)
2003	3,576	516 (14%)
2004	3,340	1,963 (59%)
2005	1,600	821 (51%)
2006	353	139 (39%)
2007	478	340 (71%)
2008	259	154 (59%)
2009	452	298 (66%)
Total	15,272	4,851

¹¹ For more information, see www.epa.gov/chp/basic/efficiency.html.

What To Expect in 2010 and Beyond

- Focus on key end-use sectors such as wastewater treatment facilities with the goal of achieving a 50-percent penetration rate over the next 3 years.
- Advance CHP's role in energy performance measurement and rating systems, such as EPA's Portfolio Manager.
- Publish the final Waste Energy Recovery Rule in the Federal Register, as required under Title IV, Subtitle D, Part E of EISA, to establish the criteria by which sources or sites will be listed in the Registry.

TABLE 14. 2009 ENERGY STAR Combined Heat and Power Awards

Bridgewater Correctional Complex Cogeneration Plant

Commonwealth of Massachusetts Department of Correction
Bridgewater, MA

Carville Energy Center

Calpine Corporation
St. Gabriel, LA

Patterson Farms CHP System

Patterson Farms
Auburn, NY

717 5th Avenue Cogeneration Plant

Equity Office Properties
New York, NY

Consolidated Edison East River Repowering Project

Consolidated Edison Company of New York
New York, NY

Duquesne University Energy Center

Duquesne University
Pittsburgh, PA

Missouri Joint Municipal Electric Utility Commission (MJMEUC) Cogeneration System

Missouri Joint Municipal Electric Utility Commission (MJMEUC)
Ladsonia, MO

STATE AND LOCAL PROGRAMS AND INITIATIVES



EPA supports state and local governments as they develop and deploy climate change and clean energy actions by providing technical assistance, analytical tools, and peer exchange opportunities. EPA helps state and local governments reduce air pollutants, GHG emissions, and energy costs through greater end-use efficiency in residential and commercial buildings and public facilities.

In 2009, state and local governments faced a different kind of opportunity in advancing clean energy—accessing and using clean energy funding made available on an unprecedented scale through ARRA. To assist, EPA:

- Designed a comprehensive website for state and local governments to access information about ARRA funding opportunities, browse implementation ideas, and learn about other government clean energy projects.
- Developed the *State and Local Guide to U.S. EPA Climate and Energy Program Resources*—providing “at-a-glance” information about EPA programs and associated resources that can be leveraged to expand or develop clean energy initiatives.
- Developed the *American Recovery and Reinvestment Act of 2009: A Guide to Renewable Energy and Energy Efficiency Opportunities for Local and Tribal Governments* to assist in identifying funding sources available under ARRA.

STATE CLIMATE AND ENERGY PROGRAM

Achievements in 2009

- Launched the new State Climate and Energy Partner Network, which helps states learn from each other about climate change and clean energy initiatives by sharing policy news and exchanging information and ideas. More than 125 state staff joined between September and December 2009.
- Released the *Clean Energy Lead by Example Guide: Strategies, Resources, and Action Steps for State Programs*. The guide identifies best practices and



examples of state-led clean energy activities; highlights the benefits and costs of taking action; and identifies issues, strategies, and resources for implementing key steps in the development of a comprehensive lead by example program.

- Released the *State Bioenergy Primer: Information and Resources for States on Issues, Opportunities, and Options for Advancing Bioenergy*, which provides an overview of biomass feedstocks, basic information about biomass conversion technologies, and a discussion of benefits and challenges of bioenergy options.

LOCAL CLIMATE AND ENERGY PROGRAM

Achievements in 2009

- Opened the first application period for the Climate Showcase Communities' \$10 million grant program and received more than 400 applications. The goal of this program is to create replicable models of sustainable community action that generate cost-effective and sustained GHG reductions while improving the environmental, economic, public health, or social conditions in a community.



- Provided support for urban heat island efforts through webcast training sessions on topics such as program implementation, climate and air quality impacts, and scientific modeling tools.
- Issued three new *Local Climate and Energy Strategy Guides* on energy efficiency in local government operations, K-12 schools, and affordable housing.

What To Expect in 2010 and Beyond

- Introduce a comprehensive new website for states and communities that will provide efficient access to current climate and energy information, tools, reporting, and peer exchange.
- Announce the first round of funding for 25 Climate Showcase Communities grant recipients and launch the 2010 round of funding applications for local and tribal government climate change initiatives.
- Release a new guide to *Assessing the Multiple Benefits of Clean Energy*.

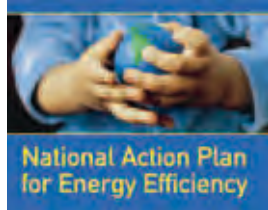
CLEAN ENERGY AND UTILITY POLICY PROGRAMS

Despite the proven economic and environmental benefits of energy efficiency, a variety of barriers have deterred utilities and state and local governments from making greater investments in these cost-effective measures. EPA provides tools and resources to support state public utility

commissions, state policy makers, and others that are exploring and implementing policies and programs to lower the barriers to adopting comprehensive energy efficiency, renewable energy, and CHP programs.

Achievements in 2009

- Continued co-facilitation of the National Action Plan for Energy Efficiency (Action Plan) with DOE. In 2009, the Action Plan released five issue papers that share policy and program options for removing key barriers to energy efficiency. The Action Plan also continued to measure state progress toward establishing a long-term framework for achieving all cost-effective energy efficiency by 2025.
- Released the Rapid Deployment Energy Efficiency (RDEE) Toolkit—in collaboration with the Leadership Group of the Action Plan—to help state and local governments choose and implement proven efficiency programs to provide



measurable and predictable energy savings and jobs. The Toolkit was developed under the guidance of and with input from the Leadership Group to assist those who received ARRA funding.

- Co-facilitated the Smart Grid Stakeholder Roundtable effort to help promote an open dialogue among various stakeholders and smart grid project developers. *Perspectives for Utilities and Others Implementing Smart Grids* summarizes the discussions among this group of state agencies, consumers, utilities, environmental groups, and others.
- Provided policy assistance to New York and California to help them accelerate the deployment of customer-sited clean distributed generation.

What To Expect in 2010 and Beyond

- Transition to the next phase of the Action Plan through the creation of the State Energy Efficiency (SEE) Action Network. SEE Action will help the nation achieve all cost-effective energy efficiency by 2020—5 years earlier than

originally envisioned—by focusing on the assistance states and local governments need to advance policies and practices that bring energy efficiency to scale.

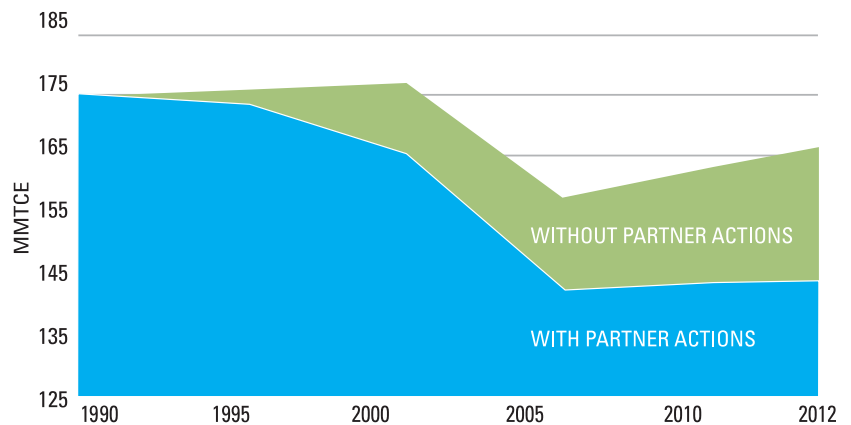
METHANE PROGRAMS



Methane (CH₄) is a potent GHG that is 23 times more effective than CO₂ at trapping heat in the earth's atmosphere. It also has a relatively short atmospheric lifetime, ranging from 9 to 15 years. Together, these characteristics make methane an excellent candidate to mitigate climate change in the near term. Methane offers a unique opportunity for cost-effective GHG emissions reductions because when recovered and used properly, it is a valuable energy resource.

EPA has established partnership programs with industry to reduce methane emissions from some of the largest sources by encouraging methane capture and use as energy. EPA's programs—Natural Gas STAR, AgSTAR, the Coalbed Methane Outreach Program, and the Landfill Methane Outreach Program—strive to remove market barriers and increase investment in cost-effective emissions reduction technologies and practices.

FIGURE 19. Partner Actions Are Projected To Maintain Methane Emissions Below 1990 Levels Through 2012



- In 2009, the combined efforts of EPA's methane programs resulted in GHG emissions reductions of 17.9 MMTCE, which is 90 percent more than the total for 2000 (see Table 15).
- Combined with a regulatory program to limit air emissions from the nation's largest landfills, these partnerships have reduced emissions from targeted sources to 14 percent below 1990 levels. They are projected to remain below 1990 levels through at least 2012 (see Figure 19).

EPA is also leveraging its experience, expertise, and success in the United States to achieve economic and environmental results on a global scale. The Methane to Markets (M2M) Partnership works with 38 partner governments and more than 1,000 public and private sector organizations around the world to accelerate the recovery and use of methane as a clean energy source (see Figure 23, p. 45).

TABLE 15. EPA's Methane Programs Meet and Surpass Goals

PROGRAM	2009 GOAL	2009 ACHIEVEMENT	2010 GOAL
NATURAL GAS STAR			
Industry Participation (% in program)	62%	62%	62%
Annual Gas Savings (MMTCE)	7.2	9.5	7.5
COALBED METHANE OUTREACH PROGRAM			
Annual Methane Reductions (MMTCE)	2.4	2.4	2.7
LANDFILL METHANE OUTREACH PROGRAM			
Number of Projects	369	418	389
Annual Methane Reductions (MMTCE)	5.9	6.0	6.2
TOTAL REDUCTIONS (MMTCE)	15.5	17.9	16.4

NATURAL GAS STAR PROGRAM

A collaborative partnership between EPA and the U.S. oil and natural gas industry, Natural Gas STAR is designed to spur the adoption of cost-effective technologies and practices that reduce methane emissions. By working with companies from the oil production sector and all sectors of the natural gas supply

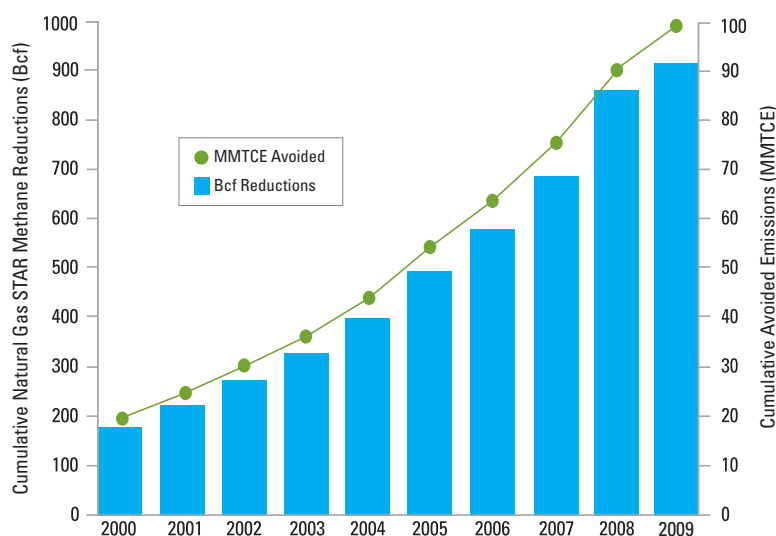


chain, Natural Gas STAR helps reduce methane losses, improve system efficiency, and ensure that more gas gets to market. Many useful program tools and resources—including technology transfer workshops, technical assistance, and peer networking forums—assist partners in implementing a wide range of cost-effective methane reduction best management practices and technologies.

Achievements in 2009

- Reduced U.S. methane emissions by 9.5 MMTCE, achieving cumulative reductions of more than 99.3 MMTCE since 1990 (see Figure 20).
- Maintained 60 percent industry participation across all major sectors—production, processing, transmission, and distribution.
- Welcomed six new partner companies, bringing the total to more than 130.
- Recognized 24 partner companies at the 16th Annual Implementation Workshop in San Antonio, TX, for their significant corporate achievements in reducing methane emissions from oil and gas systems (see Table 16, p. 40).

FIGURE 20. Natural Gas STAR Cumulative GHG Emissions Reductions and Gas Savings



What To Expect in 2010 and Beyond

- Update existing materials and develop new tools and resources that highlight the environmental and economic benefits of methane reductions to facilitate and accelerate company implementation of emissions reduction projects.
- Conduct one targeted study tour and two onsite technology transfer workshops.
- Integrate the Annual Implementation Workshop and the M2M Oil & Gas Subcommittee Meeting to reach a broader international audience.
- Perform measurement studies, provide training in leak detection and quantification methods, and conduct technology transfer workshops at oil and gas operations globally to assess key emissions sources and identify potential mitigation measures.
- Work with other federal agencies to encourage methane emissions reductions from production operations on federal lands, particularly in the western United States.

TABLE 16. 2009 Natural Gas STAR Awards

Production Partner of the Year

Chesapeake Energy *Oklahoma City, OK*

Gathering and Processing Partner of the Year

Western Gas Resources *Houston, TX*

Transmission Partner of the Year

Spectra Energy Transmission *Houston, TX*

Distribution Partner of the Year

Southwest Gas Corporation *Henderson, NV*

Continuing Excellence - 5 Years

Alliant Energy *Madison, WI*

Enbridge Energy Partners, L.P. *Houston, TX*

Energen Resources *Midland, TX*

Enogex LLC *Oklahoma City, OK*

Gulf South Pipeline *Houston, TX*

Kinder Morgan *Lakewood, CO*

Occidental Oil and Gas Corporation *Houston, TX*

Williams Production RMT Company *Denver, CO*

Continuing Excellence - 7 Years

DTE Energy - MichCon *Detroit, MI*

ExxonMobil Production Company *Houston, TX*

Northern Natural Gas *Omaha, NE*

Western Gas Resources *Houston, TX*

Continuing Excellence - 10 Years

CenterPoint Energy Minnesota Gas *Minneapolis, MN*

ConocoPhillips Petroleum Company *Houston, TX*

Continuing Excellence - 12 Years

Consumers Energy *Jackson, MI*

Southwest Gas Corporation *Henderson, NV*

Continuing Excellence - 15 Years

AGL Resources *Atlanta, GA*

Implementation Manager of the Year

Andrew McCalmont,
Chesapeake Energy *Oklahoma City, OK*

Rookie of the Year

Comgas *Sao Paulo, Brazil*

International Partner of the Year

Enbridge, Inc. *North York, Ontario*

AGSTAR PROGRAM

Through the AgSTAR Program, EPA—along with its partner the U.S. Department of Agriculture (USDA)—collaborates with the nation’s agriculture industry to reduce methane emissions by promoting the use of anaerobic (without oxygen) digesters and biogas recovery systems to manage animal wastes. EPA offers an array of tools and information designed to assist livestock producers



in evaluating and implementing methane recovery systems. The technologies and practices encouraged through AgSTAR help avoid GHG emissions, as well as reduce local water and air pollution. These methane recovery systems also become a source of renewable energy and generate other value-added products that improve farm revenues. Currently, there are more than 250 manure digester systems operating, under construction, or planned in the United States.

Achievements in 2009

- Provided technical support to USDA in selecting seven anaerobic digester projects for grant and loan funding through the Farm Bill, bringing the total disbursement of funds to digester projects through the Farm Bill to more than \$38 million since 2003.
- Supported digester-to-energy projects that produced more than 350 million kWh of renewable energy from farms capturing methane.
- Assisted in the formation and development of the American Biogas Council, a nationwide nonprofit organization aimed at advancing adoption of livestock manure digester systems.
- Welcomed eight states as AgSTAR partners to more effectively leverage expertise and resources within state energy and environmental organizations and accelerate the adoption of digester systems.
- Updated and expanded the AgSTAR national digester database to include 151 operating digesters and 130 digester projects that are planned, under construction, or shut down.

What To Expect in 2010 and Beyond

- Provide technical expertise to enable the distribution of state and federal grant and loan funds to anaerobic digester projects through USDA and other funding sources.
- Expand outreach and education to livestock producers and other stakeholders through extension events, industry meetings, and renewable energy conferences.
- Evaluate emerging digester and biogas use technologies.
- Revise and expand the AgSTAR program website to provide enhanced tools and resources targeted to livestock producers, project developers, and policy makers.
- Plan the Sixth AgSTAR National Conference, as well as regional events, to provide environmental, program, market, technical, and funding information on anaerobic digestion systems.
- Continue to expand the AgSTAR national digester database to house the latest information on the deployment of anaerobic digestion systems in the United States.

COALBED METHANE OUTREACH PROGRAM

The Coalbed Methane Outreach Program (CMOP) strives to reduce methane emissions from coal mining activities. CMOP collaborates with coal companies and related industries to reduce methane emissions through the development of environmentally beneficial, cost-effective coal mine methane (CMM) recovery and utilization projects.



systems and from mine ventilation systems, as well as from abandoned (closed) underground mines and active surface mines. CMOP provides high-quality, project-specific information and technical assistance to the coal mining industry and project developers, including project site identification, analyses of technologies, technology demonstrations, mine-specific project feasibility assessments, market evaluations, and analyses of financial incentives and regulatory hurdles.

The program primarily focuses on mitigating emissions from underground coal mines, both from degasification

Achievements in 2009

- Increased the percentage of drained CMM that is recovered and used to more than 80 percent—up from 25 percent in the early 1990s.
- Reduced emissions of methane by an estimated 2.4 MMTCE. These results include reductions from 15 active underground coal mines and reductions from about 20 projects that captured and used methane from approximately 30 closed underground U.S. coal mines.
- Welcomed the first ventilation air methane (VAM) mitigation project at an active U.S. coal mine. This project was made possible by CMOP's efforts over the years, including the recent completion of a VAM technology demonstration project co-sponsored with DOE.
- Hosted the 2009 U.S. Coal Mine Methane Annual Conference, the only forum of its kind, to address the opportunities and challenges of CMM project development in the United States, which attracted a record number of attendees and exhibitors.
- Refined tools to assist potential CMM project developers, including an online cash flow model to assess project finance and economics, a CMM degasification "primer," and support for an international "Best Practice Guidance for Effective Methane Drainage and Use in Coal Mines."
- Developed a methodology for monitoring and reporting methane emissions from underground coal mines.
- Participated in the development of an offsets methodology for CMM VAM mitigation projects and CMM drainage projects to convert methane to electricity.

What To Expect in 2010 and Beyond

- Update technical reports and analytical tools to provide the latest information on how to recover CMM and use it effectively.
- Directly engage project developers, investors, technology vendors, and the mining community through tailored outreach events, including the 2010 U.S. Coal Mine Methane Annual Conference.
- Evaluate opportunities for new CMM recovery and utilization projects.
- Work with other federal agencies to address unique challenges and barriers to CMM recovery projects on federal lands, particularly in the western United States.

LANDFILL METHANE OUTREACH PROGRAM

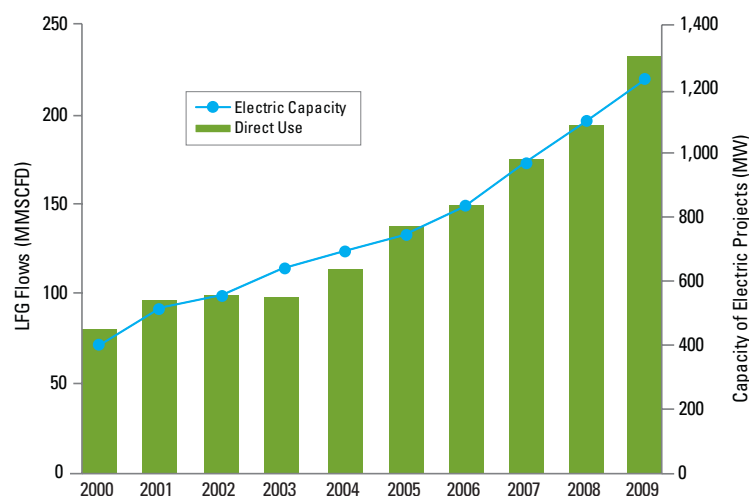
EPA established the Landfill Methane Outreach Program (LMOP) to provide technical assistance to the smaller landfills not covered by EPA regulations, as well as the larger, regulated operations that are combusting their gas but not yet using it as a clean energy source.



Through LMOP, EPA provides landfill owners and operators a suite of tools and technical resources to help them overcome the obstacles to landfill gas energy (LFGE) project development. The dual benefits of LFGE projects are (1) preventing direct methane emissions from landfills and (2) reducing indirect CO₂ emissions by displacing the electricity generated from the burning of fossil fuels (see Figure 21).

Over the past 15 years, LMOP has celebrated assisting 460 LFGE projects and surpassing 500 operational projects nationally (see Figure 22, p. 44) that collectively reduced methane emissions from landfills and avoided emissions

FIGURE 21. Direct Use and Electric Capacity of LMOP-Assisted Projects

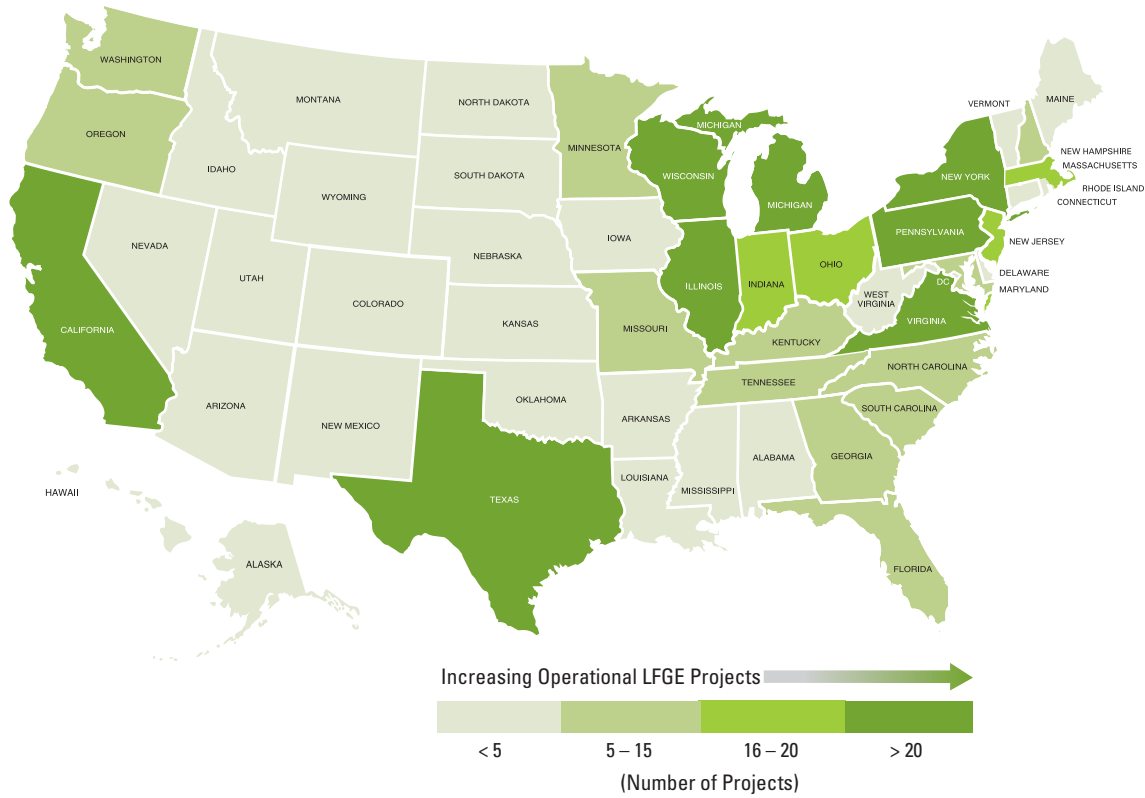


totaling about 49.8 MMTCE. These efforts are partially responsible for the approximately 15-percent decrease in methane emissions from landfills since 1990.

Achievements in 2009

- Reduced methane emissions by 6.0 MMTCE as a result of helping to develop 48 new LFGE projects and expand 15 existing projects.
- Welcomed 118 new partners, increasing participation by 15 percent and bringing the total to over 885 LMOP partners.
- Provided stakeholders technical assistance that included performing more than 65 cost analyses, conducting 40 locator searches to match end-users with landfills, running models for 37 LFGE projects, and placing an article in *Waste Age* magazine on the increasing quantity of pipeline-quality LFG projects and new technologies employed to create high-Btu gas from LFG.
- Garnered public attention for LMOP partners and LFGE projects, which were featured by numerous media outlets, including West Virginia Public Radio, *The Wall Street Journal*, and *The New York Times*. In addition, LFGE end-user SC Johnson and LMOP partner Waste Management produced their own television commercials highlighting their LFGE projects.
- Recognized the outstanding accomplishments of two landfill methane partners and six exemplary projects at the 13th Annual LMOP Conference and Project Expo, including the first LMOP award for a LFG-to-LNG (liquefied natural gas) project (see Table 17, p. 44).

FIGURE 22. Landfill Gas Energy (LFGE) Projects Across the Country



What To Expect in 2010 and Beyond

- Assist in the development of more than 40 new LFGE projects.
- Expand efforts to promote the benefits of LFGE to state and local economic development offices, emphasizing job creation and tax revenue opportunities.
- Host the 14th Annual LMOP Conference, Project Expo, and Awards Ceremony to showcase the top LMOP Partners and projects and discuss the latest industry trends.
- Continue to provide current information on incentives for LFGE through fact sheets and listserv announcements.

TABLE 17. 2009 Landfill Methane Outreach Program Awards

Projects of the Year			
University of New Hampshire EcoLine™ Project	<i>Rochester, NH</i>	Sioux Falls Landfill and POET Ethanol Direct Use Project	<i>Sioux Falls, SD</i>
Jefferson City Renewable Energy Project	<i>Jefferson City, MO</i>	Oak Grove Landfill Renewable Methane Project	<i>Winder, GA</i>
Altamont Landfill Resource and Recovery Facility	<i>Livermore, CA</i>		
Ox Mountain 11.4 MW Landfill Gas Energy Project	<i>Half Moon Bay, CA</i>		
		State Partner of the Year	
		Kansas Department of Health and Environment (KDHE)	<i>Topeka, KS</i>
		Community Partner of the Year	
		South Kent Generating Station	<i>Byron Center, MI</i>



Methane to Markets

Launched in 2004, Methane to Markets (M2M) is an international initiative that is accelerating the development of projects to reduce global methane emissions from four major sources: agricultural and food processing waste, landfills, underground coal mines, and natural gas and oil systems. There are currently over 300 U.S.- supported projects around the world. In 2009 they reduced emissions by about 2.5 MMTCE and when fully implemented they are expected to achieve annual reductions of about 16.4 MMTCE (see Figure 23). U.S. contributions have leveraged nearly \$280 million in investment from other partner countries, development banks, and the private and public sectors.

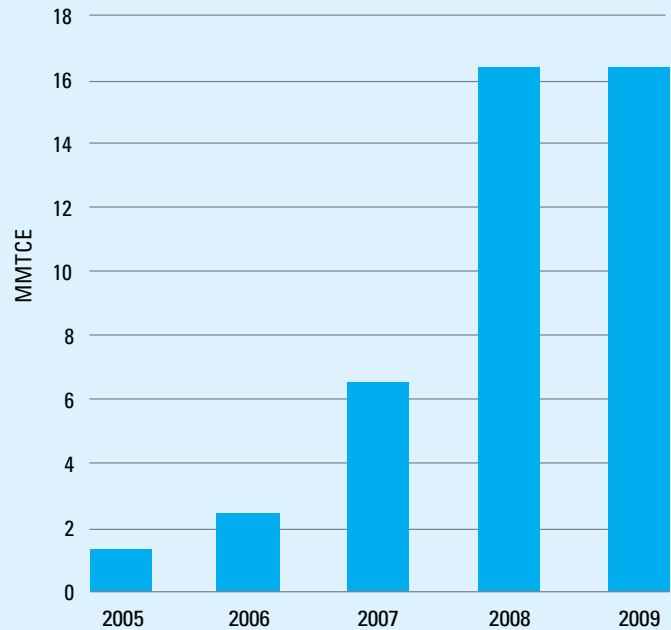
EPA is leading other federal agencies in working with M2M partners—38 national governments, including the European Union, and more than 1,000 private and public sector organizations (the Project Network). The Partnership is demonstrating that countries and the private sector can work cooperatively to reduce GHG emissions, stimulate economic growth, develop new sources of energy, and improve local environmental quality. In 2010, EPA and its M2M partners will focus on:

- Developing new projects and achieving greater reductions.
- Renewing and expanding the Partnership by finalizing a new Terms of Reference that adds new methane

sources and focuses on the development and implementation of country methane action plans.

- Holding a Ministerial meeting in October 2010 in Mexico City to launch a new Global Methane Initiative that builds on the success of M2M and accelerates international cooperation to reduce methane emissions.

FIGURE 23. GHG Reduction Potential of U.S.-Supported Projects



FLUORINATED GREENHOUSE GAS PROGRAMS



EPA continues to make progress in reducing potent GHGs through its fluorinated greenhouse gas (FGHG) partnerships. These programs help manage and limit the fluorinated gas emissions that are byproducts of U.S. industrial operations—including perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), nitrogen trifluoride (NF₃), and sulfur hexafluoride (SF₆). Although FGHGs account for a small portion of total U.S. GHG emissions, they possess very high global warming potentials (GWPs). FGHGs trap substantially more heat in the atmosphere than does CO₂ on a per-mass basis, and some can have much longer atmospheric lifetimes than CO₂ (see Table 18).

Not only have EPA's partnership programs helped partners maintain their emissions substantially below 1990 levels, they have also helped reduce emissions year to year. In 2009, the combined efforts of the FGHG partnerships resulted in reductions of 12.3 MMTCE (see Table 19). Emissions are expected to stay at these levels through the year 2012, despite potentially sizable growth in some of the participating industries (see Figure 24). EPA's suite of partnership programs has helped keep emissions down by working with partners to implement cost-effective operational improvements to the industrial process, as well as other emissions reduction strategies.

TABLE 18. Global Warming Potentials (GWPs) and Atmospheric Lifetimes of GHGs

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
HFC-134a	1,300	14
Perfluorocarbons	6,500-9,200	3,200-50,000
Sulfur Hexafluoride	23,900	3,200

Source: IPCC 1996

FIGURE 24. Partner Actions Are Projected To Maintain Emissions of Fluorinated Gases Below 1990 Levels Through 2012

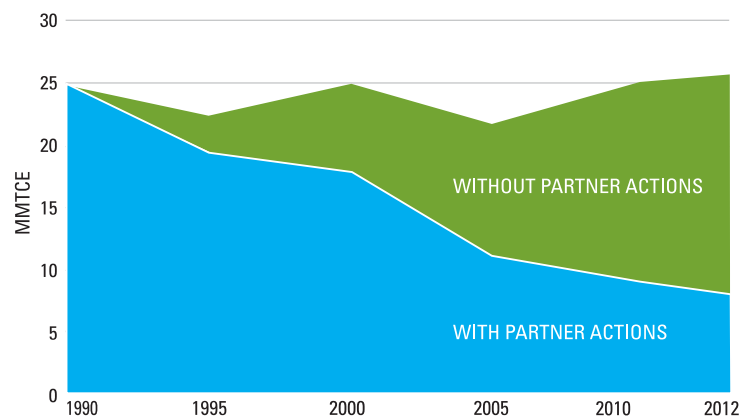


TABLE 19. Goals and Achievements of EPA's FGHG Programs

PROGRAM	2009 GOAL	2009 ACHIEVEMENT	2010 GOAL
VOLUNTARY ALUMINUM INDUSTRIAL PARTNERSHIP (VAIP)			
Industry Participation (% in program)	99%	99%	99%
Reductions (MMTCE)	2.2	2.2	2.2
HFC-23			
Industry Participation (% in program)*	100%	100%	100%
Reductions (MMTCE)**	6.1	5.0	6.3
OTHER STEWARDSHIP PROGRAMS			
Industry Participation (% in program)	50-100%	50-100%	50-100%
Reductions (MMTCE)**	6.0	5.1	6.9
TOTAL REDUCTIONS (MMTCE)	14.3	12.3	15.4

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

**Due to the global recession, lower production resulted in lower than forecast reductions.

THE VOLUNTARY ALUMINUM INDUSTRIAL PARTNERSHIP (VAIP)

EPA and the U.S. primary aluminum industry have worked together through the Voluntary Aluminum Industrial Partnership (VAIP)



since 1995 to reduce perfluorocarbon (PFC) emissions from aluminum production. Emissions of perfluoromethane (CF₄) and perfluoroethane (C₂F₆) are inadvertent byproducts of the smelting process, and emissions of CO₂ are caused

by the consumption of the carbon anode. EPA supports partners by providing technical assistance to evaluate the factors that influence PFC emissions, sharing best practices, and recognizing partners for their commitment to cutting emissions. Having agreed to reduce direct carbon intensity by 53 percent from 1990 levels by 2010, VAIP continues to make progress toward that goal by optimizing the production process through technical and managerial improvements.

Achievements in 2009

- Reduced direct GHG emissions by 2.2 MMTCE, which represents reduced PFC emissions of more than 60 percent, and reduced direct carbon emissions of more than 52 percent on a per-ton basis compared with the industry's 1990 baseline.
- Continued work with Australia, Canada, and China to implement PFC reduction strategies through training and a pilot project to demonstrate automated anode effect termination.
- Completed measurements of PFC emissions at six Chinese smelters and initiated evaluation of non-anode effect 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, 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 emissions intensity has dropped dramatically.¹²

Achievements in 2009

- Reduced emissions by 5.0 MMTCE below what they would have been had production continued at 1990 emissions intensity levels.

THE FLUORINATED GREENHOUSE GAS REDUCTION/CLIMATE PARTNERSHIP FOR THE SEMICONDUCTOR INDUSTRY

Since its inception in 1996, EPA's FGHG Reduction/Climate Partnership for the Semiconductor Industry has collaborated with semiconductor manufacturers to identify and implement FGHG reducing process changes and manufacturing tool improvements for the production of integrated circuits. The industry has developed technological improvements in four key areas: process improvements/source reductions, alternative chemicals, capture and beneficial reuse, and destruction technologies. Thanks to their persistent efforts, EPA's partners are on track to meet the 2010 global FGHG emissions reduction target set



by the World Semiconductor Council (WSC) to reduce FGHG emissions by at least 10 percent below the 1995 baseline level by the end of 2010.

The aggressive goal set by WSC is the world's first industry-wide, global GHG emissions reduction target and demonstrates the semiconductor industry's comprehensive commitment to climate protection. The present challenges for WSC and EPA include maintaining flexibility and dynamic leadership that takes into account emerging production centers in China, Malaysia, and Singapore, as well as expanding cooperation with related high-tech electronics manufacturing sectors.

Achievements in 2009

- Reduced absolute FGHG emissions by 2.5 MMTCE, or more than 85 percent below business-as-usual (BAU) levels, while U.S. manufacturing continued to expand.
- Finalized EPA's first standard protocol for characterizing the destruction or removal efficiency (DRE) of FGHG abatement technologies used by electronics manufacturers.¹³ The DRE protocol was developed and tested during an international collaborative process over a 2-year period, which included a peer review by the Japan Electronics and Information Technology Industries

Association, U.S. experts, and the Taiwan Industrial Technology Research Institute.

- Introduced a new cooperative global electronics industry framework for comprehensively addressing climate change. This expanded model of cooperation will facilitate information sharing among the major related electronics manufacturing sectors—such as semiconductors, liquid crystal displays (LCDs), microelectrical mechanical systems (MEMs), and photovoltaics—all of which are pursuing comparable climate protection goals.

¹² HFC-23 emissions intensity is the amount of HFC-23 emitted per kilogram of HCFC-22 manufactured.

¹³ For more information, see: http://www.epa.gov/semiconductor-pfc/documents/dre_protocol.pdf.

SULFUR HEXAFLUORIDE (SF₆) EMISSIONS REDUCTION PARTNERSHIP FOR ELECTRIC POWER SYSTEMS

SF₆ is the most potent and persistent GHG—it is 23,900 times more effective at trapping infrared radiation than an equivalent amount of CO₂ (see Table 18, p 46). Used primarily by electric utilities, SF₆ is a gaseous dielectric for high-voltage circuit breakers and gas-insulated substations. As such, utilities nationwide have the opportunity to make a big difference in the nation's emissions of SF₆.



EPA partners with 83 electric power companies through the voluntary SF₆ Emissions Reduction Partnership for Electric Power Systems. EPA works with the industry to share information about best management practices and cost-effective operational improvements, such as leak detection and repair, use of recycling equipment, and employee education and training. In addition to providing a means to actively address climate change, this program has helped partner companies reap financial savings through reduced SF₆ gas purchases. Members of the partnership represent 47 percent of the total U.S. transmission system.

Achievements in 2009

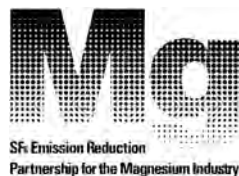
- Reduced emissions by 2.4 MMTCE, bringing average SF₆ emissions rates down to 4.5 percent of the total equipment nameplate capacity.
- Welcomed three new partner companies: California Department of Water Resources, Salt River Project, and San Diego Gas and Electric.
- Conducted a partners meeting on reducing SF₆ emissions in Chicago, IL. Guest speakers reviewed the evolving

national and state legislative and regulatory programs related to climate protection and GHG reductions. The 2-day event, hosted by ComEd, included a site visit to the state-of-the-art West Loop GIS substation where SF₆ reduction techniques were demonstrated.

- Continued to work with partners to update their SF₆ reduction goals.

SF₆ EMISSION REDUCTION PARTNERSHIP FOR THE MAGNESIUM INDUSTRY

The SF₆ Emission Reduction Partnership for the Magnesium Industry brings EPA together with U.S. magnesium industry partners and the International Magnesium Association (IMA) to identify and adopt best management practices for reducing and eliminating emissions of SF₆. Launched in 1999, this partnership works to reduce



SF₆ emissions from magnesium production and casting operations; more than 80 percent of the U.S. magnesium industry participates. The industry has made great progress in reducing emissions by optimizing equipment design and improving SF₆ gas management practices. Partners and IMA are working toward an ambitious goal, set in 2003, to completely eliminate their firms' SF₆ emissions by the end of 2010.

Achievements in 2009

- Organized and led a technical workshop with 50 participants from Chinese magnesium producing and casting companies in Shanxi Province.
- Reduced SF₆ emissions equivalent to 0.2 MMTCE. 2009 was the tenth year in which EPA collected annual SF₆ emissions reports from magnesium industry partners.

- Maintained U.S. industry participation in the partnership, representing 100 percent of primary magnesium production and 80 percent of domestic casting and recycling capacity.
- Partner Meridian Magnesium Die Casting reported its complete transition to alternative cover gases in all of

its North American manufacturing facilities. Several other partner companies also reported transitioning to alternative cover gas technologies.

- Hosted the 5th Annual Global Magnesium Industry Climate Protection Workshop in conjunction with the International

Magnesium Association's 2009 Annual World Magnesium Conference in San Francisco, CA. EPA's workshop focused on sector-specific climate protection strategies including the challenges and benefits of switching to alternative melt protection technologies.

MOBILE AIR CONDITIONING CLIMATE PROTECTION PARTNERSHIP

Motor vehicle air conditioners contribute significantly to global GHG 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 about 17 MMTCE.¹⁴ Additionally, refrigerant leakage adds 30,000 to 40,000 kilograms of HFC-134 to the atmosphere each year, equal to about 12 to 16 MMTCE.¹⁵

In 1998, the Society of Automotive Engineers (SAE) International, the Mobile Air Conditioning Society Worldwide, and EPA formed the Mobile Air Conditioning (MAC) Climate Protection Partnership—a global voluntary partnership to reduce the climate impacts of MAC systems. Membership has grown to include most of the world's vehicle manufacturers and their suppliers, as well as environmental and industry NGOs.

Achievements in 2009

- Introduced the Climate Protection Pledge, which aims to reduce HFC-134a emissions by promoting best practices in the service sector through improved technician training and recognition for shops that buy and use the best available tools and equipment.
- Completed a 5-year project to remove barriers to low-GWP refrigerants, successfully working with international, national, state, and local partners. That completion will allow the introduction of innovative new automobile air conditioning systems in 2010 and 2011.

What To Expect in 2010 and Beyond for the FGHG Programs

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

- Benchmark current emissions reduction options and costs across high FGHG industries to support partnership and policy-making activities.
- Facilitate partner efforts to transition from voluntary to mandatory emissions reporting, if required.
- Continue recruiting companies to participate in the SF₆ Emissions Reduction Partnership for Electric Power Systems and training partners to ensure the collection and reporting of high-quality data by electric power partners.
- Evaluate the technical feasibility and cost of continuous emissions monitoring (CEM) of FGHG from the electronics industry.
- Support efforts of magnesium partners to eliminate emissions of SF₆ by demonstrating alternative melt protection technologies for primary producers and secondary ingot casters.
- Maintain active partnerships with HCFC-22 chemical manufacturers to continue to reduce emissions of HFC-23.

¹⁴ For more information, see Andersen, S., et al., 2004. Carbon dioxide equivalent calculated with EPA Greenhouse Gas Equivalencies Calculator: <http://www.epa.gov/cleanenergy/energy-resources/refs.html>

¹⁵ These figures are based on sales and official U.S. EPA estimates. According to industry sources, approximately 30,000 kilograms of HFC-134a were sold into the U.S. mobile air conditioning aftermarket in 2008. The U.S. GHG Inventory estimates that in 2007 approximately 40,000 kilograms of HFC-134a were released from mobile air conditioning. The GWP of HFC-134a is 1,430.

DEMONSTRATING PROGRESS



Demonstrating Progress: Measuring Results of the EPA Climate Protection Partnership Programs

EPA's climate protection programs are an important component of the U.S. government's strategy to address climate change. EPA is committed to documenting quantifiable program results and using well-established methods to estimate the benefits of its programs. For each program, EPA has a robust process in place to regularly review and improve the program evaluation approaches.

The approaches used for each specific program are summarized in the sections below. They vary by program strategy, sector, availability of data, and market characteristics. To present the most realistic estimates of program benefits, EPA employs a common analytical framework across all of the individual program approaches:

- The benefits discussed represent the results attributable to EPA efforts above pre-existing trends or business-as-usual (BAU) scenarios.
- Program methods address data quality, potential double counting with other EPA programs, free ridership, the efforts of third-party actors, and other program-specific market effects.
- Where marginal uncertainty exists, EPA uses the best available information and best practices that yield conservative benefit estimates.
- Cumulative estimated benefits reflect the stream of energy savings that will persist through 2018 due to investments made through 2009. For this analysis, EPA assumes no new investments will be made through its programs in 2010 or beyond.
- Financial benefits are placed in present value terms.

Environmental and financial benefits for 2000 to 2009 are summarized in Table 2 on page 5. The historical environmental benefits and cost effectiveness of these programs are summarized on pages 52 and 53 (see Table 20). The information presented in this 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.

EPA Programs Are Highly Cost-Effective Mechanisms for Reducing GHG Emissions

EPA's climate protection programs are a very cost-effective approach for reducing U.S. GHG emissions. Moreover, it is clear from sources such as the IPCC's Fourth Assessment Report and McKinsey's study, "Reducing Greenhouse Gas Emissions: How Much at What Cost?" 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 2009 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.

ENERGY STAR

Through the ENERGY STAR program, EPA helps U.S. businesses and consumers save money and reduce GHG emissions by labeling energy-efficient products, raising the bar of energy efficiency in new home construction, and encouraging superior energy management practices in the commercial and industrial sectors. The methods for estimating the benefits of each of these strategies are described below.

Products

- Sales of products due to the ENERGY STAR program are determined as those above and beyond established BAU purchases of these products.¹⁶ 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 with 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 they typically reflect increasing market shares for efficient products and increasing product efficiencies over time.
 - Applying a conservative estimate of the effect of market transformation to account for EPA efforts
 - when product specifications are revised and qualified product shipments fall as manufacturers transition to the new specification.
- 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 qualified 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.

¹⁶ For more details on many aspects of this method, see Homan et al., 2010 and Weber et al., 2000.

TABLE 20. Overview of EPA's Climate Partnership Programs Reviewed in This Annual Report With GHG Reductions Since 2000

PROGRAM	GHGS ADDRESSED	KEY SECTOR(S)	SCOPE OF PARTNERS AS OF 2009	GHG REDUCTIONS* (MMTCE)									
				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
ENERGY STAR	CO ₂	Residential, Commercial, Industrial	17,000	14.6	17.7	21.3	25.0	28.3	31.5	35.0	39.5	42.6	46.3
Climate Leaders	All	Commercial, Industrial	270	Climate Leaders' reductions are reflected in the data shown for other programs.									
State Climate and Energy Program	CO ₂	State Government	—	—	—	—	—	—	—	—	—	—	—
CLEAN ENERGY SUPPLY¹													
Green Power Partnership	CO ₂	State & Local Government, Commercial, Industrial	1,200	—	—	0.6	1.0	2.0	3.2	3.7	4.8	6.1	6.5
Combined Heat & Power Partnership	CO ₂	Commercial, Industrial	350	—	—	0.6	1.0	2.0	3.2	3.7	4.8	6.1	6.5
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	10.2	12.6	9.5
Coalbed Methane Outreach Program (CMOP)	CH ₄	Coal Mining	—	2.1	2.3	1.7	1.7	2.0	2.0	2.5	2.2	2.2	2.4
Landfill Methane Outreach Program (LMOP)	CH ₄	Waste Management	885	3.2	3.7	3.9	4.1	4.4	4.5	4.8	5.2	5.5	6.0
FGHG PROGRAMS													
Voluntary Aluminum Industrial Partnership	PFCs	Aluminum Smelting	99% of industry	2.0	2.1	1.8	2.2	2.2	2.3	2.4	2.5	2.5	2.2
HFC-23 Partnership	HFCs	Chemical Industry	100% of industry	4.7	5.1	4.5	6.1	6.4	6.2	7.0	7.0	7.3	5.0
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	3.9	4.3	5.0	5.1
Mobile Air Conditioning (MAC) Partnership	CO ₂ HFCs	MAC Industry	—	Working toward technology improvement goals									

¹ GHG reductions are for both the Green Power Partnership and Combined Heat and Power Partnership.

*These reductions reflect the most up-to-date data collected from EPA partners and may differ from reductions reported in previous annual reports.

—: Not applicable

- 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 qualified product above a standard model over the product lifetimes discussed above.¹⁷ All energy bill calculations use national sector-specific fuel prices.
- Avoided emissions of GHGs for 2009 are determined using marginal emissions factors for CO₂ based on factors established as part of the U.S. government's reporting process to the UN Framework Convention on Climate Change, as well as historical emissions data from EPA's eGRID database.¹⁸ For future years, EPA uses factors derived from energy efficiency scenario runs of the integrated utility dispatch model, Integrated Planning Model (IPM[®]).¹⁹

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 specification 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 bill savings is 30 years.
- Peak power savings and avoided emissions of GHGs are determined using approaches similar to those described for products.

Commercial Buildings

- Annual electricity and natural gas savings are determined based on a peer-reviewed methodology developed for the commercial building sector.²⁰ 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, other federal programs—such as DOE's Rebuild and Federal Energy Management Program (FEMP)—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 demand-side management (DSM) and market transformation programs. The methodology used for 2009 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.²¹
- 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 GHGs are determined using marginal emissions factors for CO₂ as with products.

Industry

Annual industrial electricity and natural gas savings are determined using a peer-reviewed methodology similar to that used for the commercial sector.²² The methodology distinguishes savings due to ENERGY STAR from those due to utility-run DSM programs and other market transformation programs such as DOE's Industrial Technology Program (ITP). GHG emissions are calculated using marginal CO₂ emissions as with products.

¹⁷ Calculated using a 7% discount rate and 2009 perspective.

¹⁸ For more details on eGRID, see U.S. EPA, 2008.

¹⁹ For more details on IPM, see U.S. EPA, 2010a.

²⁰ For more details on many aspects of this method, see Horowitz, M.J., 2010 and 2007.

²¹ For more details on many aspects of this method, see Horowitz, M.J., 2010.

²² For more details on many aspects of the previous methods, see Horowitz, M.J., 2004 and 2001.

THE CLEAN ENERGY SUPPLY PROGRAMS

Combined Heat and Power (CHP) Partnership

The CHP Partnership dismantles the market barriers stifling investment in environmentally beneficial CHP projects. 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 onsite CHP. Avoided emissions of GHGs from more efficient energy generation are determined using marginal emissions factors derived from energy efficiency scenario runs of 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 benefits between this and other partnerships by having program staff meet annually to identify and resolve any overlap issues.

Green Power Partnership

The Green Power Partnership boosts supply of clean energy by helping U.S. businesses purchase electricity from green generation sources. As a condition of partnership, program partners submit data annually on their purchases of qualifying green power products. These data are screened and any issues resolved.

Avoided emissions of GHGs are determined using marginal emissions factors for CO₂ 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.

THE METHANE PROGRAMS

EPA's methane programs facilitate recovering methane from landfills, natural gas extraction systems, agriculture, and coal mines as well as using methane as a clean energy resource. The expenditures used in the program analyses 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.

Natural Gas STAR Program

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.

Landfill Methane Outreach Program

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, the Landfill Methane Outreach Program's (LMOP's) outreach efforts, and other sources.

Reductions of methane that are the result of 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 Program

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 CMM; such efforts are entirely voluntary. EPA estimates CMM recovery attributable to its program activities on a mine-specific basis, based on the program's interaction with each mine.

THE FLUORINATED GREENHOUSE GAS PROGRAMS

Due to the small pool of potential partners for the FGHG programs, 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 FGHG emissions.

Reductions are calculated by comparing current emissions to a BAU baseline that uses the industry's 1990 emissions rate. Changes in the emissions rate (per ton production) are used to estimate the annual GHG emissions and reductions that are a result of the program.

The aluminum industry began making significant efforts to reduce FGHG 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 BAU baseline that uses the industry's 1990 emissions rate. Changes in the emissions rate are used to estimate

the annual GHG emissions and reductions that are a consequence of 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

EPA's Environmental Stewardship Programs include the PFC and SF₆ Electric and Magnesium Reduction Partnerships. 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 designated third party.

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

The share of the reductions attributable to EPA's programs is 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-11-002
www.epa.gov
December 2010**



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