Environmental Protection Agency
2005 Annual Performance Plan and Congressional Justification

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FY 2005 Annual Performance Plan and Congressional Justification

Clean Air and Global Climate Change

STRATEGIC GOAL: Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced. Reduce greenhouse gas intensity by enhancing partnerships with businesses and other sectors.

Resource Summary
(Dollars in thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Clean Air and Global Climate Change	**$882,811.6**	**$915,983.1**	**$1,004,615.5**	**$88,632.4**
Healthier Outdoor Air	$557,907.1	$579,059.2	$659,876.2	$80,817.1
Healthier Indoor Air	$44,299.1	$48,042.5	$48,954.7	$912.1
Protect the Ozone Layer	$18,145.2	$19,069.4	$21,813.7	$2,744.3
Radiation	$30,046.8	$34,858.9	$34,718.0	($141.0)
Reduce Greenhouse Gas Intensity	$99,836.4	$106,936.5	$108,389.3	$1,452.9
Enhance Science and Research	$132,577.0	$128,016.6	$130,863.6	$2,847.1
Total Workyears	2,702.6	2,737.9	2,756.6	18.7

BACKGROUND AND CONTEXT

Based on air quality trends measured at more than 5000 monitoring sites across the U.S., air quality has improved steadily since the 1970s. This improvement has occurred even as Gross Domestic Product has increased by 164 percent, miles traveled by cars and trucks have increased 155 percent, energy consumption has increased by 42 percent; and population has increased by 38 percent.[1]

Concerted efforts and steady progress have achieved cleaner, healthier air, but air pollution continues to be a human health and environmental problem in the U.S. and around the world. The average adult breathes over 3,400 gallons of air every day. Children are more susceptible to air pollution because they breathe even more air per pound of body weight than adults. Children also are at greater risk because they are more active outdoors and their lungs are still developing. The elderly are more sensitive to air pollution because they often have heart or lung disease.[2]

Pollutants in the air cause cancer or other serious health effects, including respiratory, developmental, and reproductive problems. Certain pollutants, such as some metals and certain organic chemicals, that are emitted from industrial and other sources can be deposited into water

[1] U.S. EPA, *Latest Findings on National Air Quality: 2002 Status and Trends Report*, 454/K-03-001 (August 2003), http://www.epa.gov/airtrends/.
[2] Ibid

bodies and magnified through the food web, adversely affecting fish-eating humans and animals. Air pollution also damages crops and forests, makes soil and waterways more acidic, reduces visibility, and accelerates corrosion of buildings and monuments.[3]

In addition, air pollutants diminish the protective ozone layer in the upper atmosphere. Human activities also affect the mixture of gases in the atmosphere and contribute to the potential for world climate change.

Outdoor Air Pollution: The Clean Air Act[4] addresses three general categories of outdoor air pollution: "criteria" pollutants, air toxics, and acid rain. Criteria pollutants include six common pollutants: particulate matter (PM), ozone, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead, for which EPA sets National Ambient Air Quality Standards to protect public health and the environment. Air toxics, also called hazardous air pollutants (HAPs), are pollutants that are known or suspected to cause cancer or other serious health problems, such as reproductive effects or birth defects, or adverse ecological effects. The Clean Air Act lists 188 HAPs. Examples include: dioxin, mercury, benzene, toluene, and xylene. Acid rain is formed when SO_2 and nitrogen oxides (NO_x) react in the atmosphere with water, oxygen, and oxidants to form acid droplets.

The paragraphs below summarize the health and environmental effects associated with the six criteria pollutants, air toxics, and acid rain.[5]

- Particulate matter. PM is associated with a wide variety of health and environmental problems. When exposed to higher concentration of fine PM, people with existing lung or heart diseases – such as asthma, chronic obstructive pulmonary disease, congestive heart disease, or coronary artery disease – are at increased risk of health problems requiring hospitalization or of premature death. Similarly, children and people with existing lung disease may not be able to breathe as deeply or vigorously as they normally would and they may experience symptoms such as coughing and shortness of breath. Fine PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis, causing more use of medication and more doctor visits.

  PM also is a major cause of haze and reduced visibility in parts of the U.S., including many of our national parks. Particles can be carried over long distances by wind and then settle on ground or water. The effects of certain PM settling may include acidifying lakes and streams, changing the nutrient balance in coastal waters and watersheds, depleting the nutrients in soil, damaging sensitive forests and farm crops, and decreasing the diversity of ecosystems.

- Ground-level ozone (smog). When breathed at any concentration, ozone can irritate and inflame a person's airways. Health effects attributed to exposures to ozone, generally while individuals are engaged in moderate or heavy exertion, include

[3] Ibid
[4] Clean Air Act Title 1, Part A and Part D, Subparts 3 and 5 (42 U.S.C. 7401-7431, 7512-7512a, 7514-7541a)(15 U.S.C. 2605); Clean Air Act Amendments Title II (42 U.S.C. 7521-7590); Clean Air Act Amendments, Title IV (42 U.S.C. 7651-7661); Clean Air Act (42 U.S.C. 7401-7671q)
[5] *Latest Findings on National Air Quality: 2002 Status and Trends Report*

significant decreases in lung function and increased respiratory symptoms such as chest pain and cough as concentrations rise. Exposures to ozone result in lung inflammation, aggravate respiratory diseases such as asthma, and may make people more susceptible to respiratory effects. Other at-risk groups include adults who are active outdoors and individuals with respiratory disorders such as asthma.

Ground-level ozone interferes with the ability of many plants to produce and store food. This reduces crop and forest yields by making plants more susceptible to disease, insects, other pollutants, and harsh weather. Ozone also damages the leaves of trees and other plants, affecting the appearance of cities, national parks, and recreation areas.

- Sulfur dioxide. Peak levels of SO_2 can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposure to a combination of SO_2 and fine particles can cause respiratory illness, alter the defense mechanisms of lungs, and aggravate cardiopulmonary disease. People who may be most susceptible to these effects include individuals with cardiovascular disease or chronic lung disease, as well as children and the elderly. SO_2 also is a major contributor to acidic deposition.

- Nitrogen dioxide. Exposure to NO_2 causes respiratory symptoms such as coughing, wheezing, and shortness of breath in children and adults with respiratory diseases such as asthma. Even short exposures to NO_2 affect lung function. NO_2 also contributes to acidic deposition, eutrophication in coastal waters, and visibility problems.

- Carbon monoxide. The health threat from even low levels of CO is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart disease. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise. Even healthy people can be affected by high levels of CO. People who breathe higher levels of CO can develop vision problems, experience reduced ability to work or learn, have reduced manual dexterity, and have difficulty performing complex tasks. CO is most dangerous in enclosed or confined spaces and will cause death.

- Lead. Lead causes damage to the kidneys, liver, brain and nerves, and to other organs. Excessive exposure to lead causes seizures, mental retardation, behavioral disorders, memory problems, and mood changes. Low levels of lead damage the brain and nerves in fetuses and young children, resulting in learning deficits and lowered IQ.

- Air toxics: Air toxics or HAPs, are pollutants that are known or suspected to cause cancer or other serious health problems, such as reproductive effects or birth defects, or adverse environmental effects. HAPs are emitted from thousands of sources, including automobiles, utilities, and industries. HAPs also can contribute to the levels of PM and volatile organic compounds (VOCs), precursors to ozone. Adverse effects to human health and the environment due to HAPs can result from even low level exposures to air toxics from individual facilities, exposures to mixtures of pollutants found in urban settings, or exposures to pollutants emitted from distant sources that are transported through the atmosphere over regional, national, or even global airsheds.

Compared to information for the six criteria pollutants, the information about the ambient concentrations of HAPs and their potential health effects is relatively incomplete. Most of the information on the potential health effects of these pollutants is derived from experimental data. Of the 188 HAPs, almost 60 percent are classified by the Clean Air Act (section 112 (f)(2)(A)) as known, probable, or possible carcinogens. One of the often-documented ecological concerns associated with toxic air pollutants is the potential to damage aquatic ecosystems.

- Acid rain. Emissions of SO_2 and NO_x react in the atmosphere and fall to earth as acid rain, causing acidification of lakes and streams and contributing to the damage of trees at high elevations. Acid deposition also accelerates the decay of building materials and paints and contributes to degradation of irreplaceable cultural objects, such as statues and sculptures. NO_x deposition contributes to eutrophication of coastal waters, such as the Chesapeake Bay and Tampa Bay. Before falling to earth, SO_2 and NO_x gases form fine particles (fine PM) that affect public health by contributing to premature mortality, chronic bronchitis, and other respiratory problems.

Indoor Air Pollution: Indoor air levels of many pollutants may be two to five times, and occasionally more than 100 times, higher than outdoor levels. There is no comprehensive monitoring of the quality of indoor air in the U.S. and the actual levels for many pollutants are not well understood. Indoor air pollutants are of particular concern because most people spend as much as 90% of their time indoors. Common sources can include burning kerosene, wood, or oil; smoking tobacco products; releases from household cleaners, pesticides, building materials; and radon. Inadequate ventilation can increase indoor pollutant levels by not bringing in enough outdoor air to dilute emissions from indoor sources and by not carrying indoor air pollutants out of the home. High temperatures and humidity levels can also increase concentrations of some pollutants.

Poor indoor air quality can cause short-term problems, including headaches, fatigue, dizziness, nausea, and a scratchy throat. Other effects include cancer – particularly from long-term exposure to high secondhand smoke and radon concentrations – and aggravation of chronic respiratory diseases such as asthma. Exposure to naturally occurring radon gas is the second leading cause (after smoking tobacco) of lung cancer among Americans.[6]

Climate Change: The buildup of greenhouse gases—primarily carbon dioxide, methane, and nitrous oxide—has heat-trapping properties that may impact climate on Earth. These potential regional climate changes could alter forests, crop yields, and water supplies. These changes could also threaten human health, and harm birds, fish, and many types of ecosystems.

Stratospheric Ozone Depletion: A protective ozone layer is located in the stratosphere about six to 30 miles above the Earth's surface. This layer protects humans and other species from the sun's harmful ultraviolet radiation (UV). This protective shield is being damaged by chemicals such as chlorofluorocarbons (CFCs), halons, and methyl bromide, and can lead to

[6] Institute of Medicine, *Clearing the Air: Asthma and Indoor Air Exposures* (Washington, DC: The National Academy Press, 200). Available at http://books.nap.edu/books/0309064961/html/R1.html.

harmful health effects such as skin cancer and cataracts.[7] Increased UV also can lead to reduced crop yield and disruptions in the marine food chain.

Ozone depletion and climate change are separate environmental issues but are related in some ways. Specifically, some substances that deplete the ozone layer also are potent and very long-lived greenhouse gases that absorb outgoing radiation and warm the atmosphere.

Radiation: Radiation occurs naturally (e.g., radon), but we also use radioactive materials in electricity generation, in industrial processes, and in medical diagnoses and treatments. Any activity that produces or uses radioactive materials generates radioactive waste. Mining, nuclear power generation, and various processes in industry, defense, medicine, and scientific research produce byproducts that include radioactive waste. Radioactive waste can be in gas, liquid, or solid form, and the level of radioactivity can vary. The waste can remain radioactive for a few hours or several months or even hundreds of thousands of years. Frequent exposures to radiation can cause cancer and other adverse health effects.

Science and Research: EPA relies on sound science in its clean air programs. EPA uses sound science to determine the relative risks that air pollution poses to human health and the environment. In addition, the Agency utilizes science in an attempt to identify the best means to detect, abate and avoid environmental problems associated with air pollutants.

MEANS AND STRATEGY

The air problems that now remain are some of the most difficult to solve. EPA's strategy to address the overall goals of the clean air program includes a combination of national and local measures that reflect the different roles of Federal, state, Tribal, and local governments. EPA, states, and local agencies work together as partners to meet clean air goals cost-effectively by employing an array of regulatory, market-based, and voluntary approaches and programs. Federal assistance and leadership are essential for developing and implementing cooperative programs to prevent and control air pollution; for ensuring that national standards are met; and for providing tools for states, Tribes, and local communities to use in preparing and implementing their clean air plans and programs.

Healthier Outdoor Air: Problems with broad regional, national or global impact – emissions from power plants and other large sources, pollution from motor vehicles and fuels, and stratospheric ozone depletion – are best handled primarily at the multi-state, regional, or Federal level. A national approach allows for the use of traditional, regulatory tools where appropriate, and enables EPA to implement innovative, market-based techniques such as emissions trading, banking, and averaging, and other national programs cost-effectively.

States, Tribes, and local agencies can best address the regional and local problems that remain after Federal measures have been fully applied. Many of these approaches employ

[7] June 1999, "Synthesis Report of the Reports of the Scientific, Environmental Effects, Technology and Economic Assessment Panels of the Montreal Protocol: A Decade of Assessments for Decision Makers Regarding the Protection of the Ozone Layer: 1988 - 1999" ; January 2003, Report of the Montreal Protocol Science Assessment Panel, "Scientific Assessment of Ozone Depletion: 2002"; March 2003, Report of the Montreal Protocol Environmental Effects Assessment Panel, "Environmental Effects of Ozone Depletion: 2002".

innovative techniques, such as diesel retrofits and community-based approaches to toxics that are well-suited to the local nature of many air-related problems. EPA works closely with public- and private-sector partners and stakeholders to develop the tools – such as monitoring, modeling, and emission inventories – that allow states, Tribes, and localities to address these more localized problems.

EPA will also work to build the institutional capacity within developing countries and regionally manage air pollution, focusing on those countries that have demonstrated potential and commitment to affect human health and the environment globally. Programs include those that address clean fuels, reduction of mercury and lead emissions, training on various air quality issues, and partnering with existing clean air initiatives.

To improve air quality and address the highest health and environmental risks, EPA will proceed with Federal stationary and mobile source programs aimed at achieving large, nationwide, cost-effective reductions in emissions of PM and its contributors such as SO_2, NO_x, and elemental and organic carbon; ozone-forming NO_x; and volatile organic compounds (VOCs).

The President's Clear Skies Initiative is a cornerstone of the EPA strategy. The proposed legislation, re-introduced in the Congress in February 2003, would create a mandatory program that is designed to reduce dramatically power plant emissions of SO_2, NO_x, and mercury, three of the most harmful air pollutants from power generators, from FY 2000 levels.[8] (Alternatively, the Interstate Air Quality and Utility Mercury Reduction Rules are integrated air rules proposed by EPA in December 2003 to achieve many of Clear Skies' objectives absent new legislation.).[9] Both Clear Skies and the proposed integrated air rules would create a market-based program, with results guaranteed by emissions caps instituted over a period of time, an approach that proved successful in reducing acid rain. As the Clear Skies Initiative moves forward, through enactment of new legislation or promulgation of the proposed Interstate Air Quality and Utility Mercury Reduction Rules, EPA will continue to implement the Acid Rain Program to reduce SO_2 and NO_x emissions from electric power generators and address the interstate transport of ozone and NO_x through the NO_x Budget Program, a multi-state emissions allowance trading program under the NO_x SIP Call. In addition, EPA is implementing national programs that will dramatically reduce future emissions from a wide range of mobile sources, including cars, minivans, sport utility vehicles (SUVs), trucks, buses, motorcycles, and nonroad engines.

EPA will propose whether to update the particulate matter standards in FY 2005 and will continue the work necessary to propose whether to update the ozone standard in FY 2006. EPA also will provide guidance and technical support to states, Tribes and local communities to help meet multiple air quality standards and regional haze progress goals, especially for those pollutants that share common precursors or emission sources.

Healthier Indoor Air: EPA implements two primary strategies to meet its human health objective for indoor air quality, increasing public awareness and increasing partnerships with non-governmental and professional entities. EPA raises public awareness of actual and potential indoor air risks so that individuals can take steps to reduce exposure. Outreach activities, in the

[8] Senate and House of Representatives, Clear Skies Legislation Act of 2002, S. 2815 (July 29, 2002) and H.R. 5266 (July 26, 2002), http://www.epa.gov/clearskies/bill.pdf

[9] 40CFR Parts 51, 72, 75, 96 Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Interstate Air Quality Rule) web site www.epa.gov/interstateairquality/

form of educational literature, media campaigns, hotlines, and clearinghouse operations, provide essential information about indoor air health risks not only to the public, but to the professional and research communities as well.

Underpinning EPA's outreach efforts is a strong commitment to environmental justice, community-based risk reductions, and customer service. Through partnerships, EPA disseminates multi-media materials encouraging individuals, schools, and industry to take action to reduce health risks in their indoor environments. In addition, EPA uses technology transfer to improve the ways in which all types of buildings, including schools, homes, and workplaces, are designed, operated, and maintained. To support these voluntary approaches, EPA incorporates the most current science available as the basis for recommending ways that people can reduce exposure to indoor contaminants.

Reduce Greenhouse Gas Intensity: In 2002, President Bush announced a new approach to global climate change designed to harness the power of the marketplace and technological innovation. The President committed America to cut greenhouse gas intensity by 18 percent over the next decade.[10] EPA's voluntary climate programs play a major role in meeting this goal by working in partnership with businesses and other sectors through programs that deliver multiple benefits while improving overall scientific understanding of climate change and its potential consequences. The core of EPA's climate change efforts are voluntary government/industry partnership programs – such as the ENERGY STAR program - designed to capitalize on the tremendous opportunities available to consumers, businesses, state and local governments, and organizations to make sound investments in energy efficient equipment and practices. These voluntary programs remove barriers to existing and emerging technologies in the marketplace, resulting in faster deployment of energy efficient technology into the residential, commercial, transportation, and industrial sectors of the economy.

Through its Clean Automotive Technology (CAT) program, EPA develops unique new technologies with high potential for improving air quality and dramatically improving vehicle efficiency. Through partnerships with industry, significant elements of EPA's technologies will be introduced commercially by vehicle manufacturers before the end of the decade. In addition, EPA works with other key stakeholders in promoting the development and commercialization of fuel cell technology in support of U.S. environmental, energy, and national security goals.

Protect the Ozone Layer: EPA's strategy for restoring the ozone layer includes carrying out a program that includes domestic rules and international technology transfer. As a signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer, the U.S. is obligated to regulate and enforce the terms of the treaty domestically. In accordance with this treaty and related Clean Air Act requirements, EPA will continue to implement the domestic rule-making agenda for the reduction and control of ozone-depleting substances (ODSs) and enforce rules controlling their production, import, and emission. This includes combining market-based regulatory approaches with sector-specific technology guidelines and facilitating the development and commercialization of alternatives to methyl bromide and HCFCs. EPA will strengthen outreach efforts to ensure efficient and effective compliance, and continue to identify

[10] The White House, Office of the Press Secretary, President Announces Clear Skies & Global Climate Change Initiatives (February 14, 2002), http://www.whitehouse.gov/news/releases/2002/02/20020214-5.html

and promote safer alternatives to curtail ozone depletion. To help reduce international emissions, EPA will assist with the transfer of technology to developing countries and work with them to accelerate the phase-out of ODSs. EPA estimates that the worldwide phase-out of ODS will save 6.3 million lives from fatal cases of skin cancer, avoid 299 million cases of nonfatal skin cancers, and avoid 27.5 million cases of cataracts in the U.S. alone between 1990 and 2165.

Because the ozone layer is not expected to recover until the middle of this century at the earliest, the public will continue to be exposed to higher levels of UV radiation than existed prior to the use and emission of ODS. Recognizing this and the public's current sun-exposure practices, EPA will continue education and outreach efforts to encourage behavioral changes the primary means of reducing UV-related health risks.

Radiation: EPA continues to meet the statutory mandates for managing radiation waste and controlling radioactive emissions and to fulfill its responsibilities under Presidential Decision Directives for radiological emergency preparedness and response. These responsibilities form the core of our strategy to protect the public and the environment from unnecessary exposure to radiation. EPA works with states, Tribes, and industry to develop innovative training, public information and voluntary programs to minimize these exposures.

Science and Research: To support achievement of its clean air objectives and the overall goal of clean air for American communities and surrounding ecosystems, EPA will ensure that efforts to reduce environmental risks are based on the best available scientific information. In addition, EPA will continue to integrate critical scientific assessment with policy, regulatory and non-regulatory activities.

EPA's air pollution research supports the Agency's mandated responsibilities under the Clean Air Act. This research falls into two distinct groups: 1) research supporting the development and achievement of the national ambient air quality standards (NAAQS), and 2) research on hazardous air pollutants. NAAQS-related research focuses on tropospheric ozone and particulate matter (PM), while the Air Toxics Research program provides the scientific underpinnings of the Agency's activities to reduce hazardous air pollutants (HAPs) as identified in the Clean Air Act.

PM research provides methods, models, and data on the health risks associated with exposure to PM, alone and in combination, focusing on exposures, health effects, mechanisms of injury, and identification of PM components that affect public health. In addition, both PM and tropospheric ozone research provide implementation tools to support efforts by industry, state, Tribal, and local regulators to develop and improve State Implementation Plans (SIPs) to attain the NAAQS.

Research on air toxics investigates the root causes of the environmental and human health problems in urban areas related to these pollutants. Efforts in this area provide the necessary health effects data, measurements, methods, models, information, and technical support to Federal, state, Tribal, and local regulators and industry to estimate human health effects and aggregate exposures to hazardous air pollutants. Research also supports atmospheric and emission modeling in order to estimate fate, ambient concentrations, and mobile source emissions of air toxics at a more refined scale. With this information, the Agency will be in a better position to determine risk and develop alternative strategies for maximizing risk reduction.

Several mechanisms are in place to ensure a high-quality air research program at EPA. The Research Strategies Advisory Committee (RSAC) of EPA's Science Advisory Board (SAB), an independent chartered Federal Advisory Committee Act (FACA) committee, meets annually to conduct an in-depth review and analysis of EPA's Science and Technology account. The RSAC provides its findings to the House Science Committee and sends a written report on the findings to EPA's Administrator after every annual review. Moreover, EPA's Board of Scientific Counselors (BOSC) provides counsel to the Assistant Administrator for the Office of Research and Development (ORD) on the operation of ORD's research program. Also, under the Science to Achieve Results (STAR) program all research projects are selected for funding through a rigorous competitive external peer review process designed to ensure that only the highest quality efforts receive funding support. Our scientific and technical work products must also undergo either internal or external peer review, with major or significant products requiring external peer review. The Agency's Peer Review Handbook (2nd Edition) codifies procedures and guidance for conducting peer review.

STRATEGIC OBJECTIVES AND FY 2005 ANNUAL PERFORMANCE GOALS

Healthier Outdoor Air

- The number of people living in areas with monitored ambient ozone concentrations below the NAAQS for the 1-hour ozone standard will increase by 4% (relative to 2004) for a cumulative total of 53% (relative to 1992).
- The number of people living in areas with monitored ambient PM concentrations below the NAAQS for the PM-10 standard will increase by 1% (relative to 2004) for cumulative total of 7% (relative to 1992).
- Air toxics emission nationwide from stationary and mobiles sources combined will be reduced by an additional 1% of the updated 1993 baseline of 6.0 million tons for a cumulative reduction of 38%.

Healthier Indoor Air

- 843,300 additional people will be living in homes with healthier indoor air.
- 1,312,500 students, faculty and staff will experience improved indoor air quality in their schools.

Protect the Ozone Layer

- Restrict domestic consumptio0n of class II HCFCs below 9,906 ODP-weighted metric tons (ODP MTs) and restrict domestic exempted production and import of newly produced class I CFCs and halons below 10,000 ODP MTs.

Reduce Greenhouse Gas Intensity

- Greenhouse gas emissions will be reduced from projected levels by approximately 90 MMTCE per year through EPA partnerships with businesses, schools, state and local governments, and other organizations.

Radiation

- Certify that 40,000 55-gallon drums of radioactive waste (containing approximately 120,000 curies) shipped by DOE to the Waste Isolation Pilot Plant are permanently disposed of safely and according to EPA standards.

Enhance Science and Research

- Transfer hybrid powertrain components, originally developed for passenger car applications, to meet size, performance, durability, and towing requirements of Sport Utility Vehicle and urban delivery vehicle applications with an average efficiency improvement of 30% over the baseline.

HIGHLIGHTS

Ensure Healthier Outdoor Air

In FY 2005, EPA will significantly expand its efforts to reduce children's exposure to diesel exhaust and the amount of air pollution created by diesel school buses through its Clean School Bus USA program. More than 24 million children in the US ride a bus to and from school every day and research has found that these children can be exposed to high levels of diesel exhaust. The Agency's Clean School Bus USA program is designed to help reduce this exposure by providing grant funds to State, tribal, or local government entities to upgrade (or "retrofit") newer school buses with better emission control technologies and/or fuel them with cleaner fuels or to replace the oldest school buses in the fleet with new, less polluting buses. In FY 2005, EPA will develop a grant solicitation process that will award these funds on a competitive basis.

In FY 2005, EPA will complete an assessment of how sources create Fine PM in the air and, with along with mercury emissions, the effect on downwind areas. This assessment will support the Fine PM NAAQS implementation, the Interstate Air Quality Rule and the Utility Mercury Reductions Rule. This work will also support the President's legislative proposal on Clear Skies. EPA will begin implementation efforts for both the Interstate Air Quality Rule and the Utility Mercury Reductions Rule.

The Agency will also continue to work with states, Tribes and local communities to reduce exposure to air pollution through implementation of the National Ambient Air Quality Standards. We will provide technical support to states in developing State Implementation Plans to aid them in considering the transport of pollution on a regional level in their plans. For particulate matter, EPA will be finalizing attainment designations while working with states and local areas to develop control strategies to reduce emissions. For ozone, since designation will be finalized in 2004, the Agency will be supporting SIP development efforts while working with localities on innovative measures to provide early emission reductions.

For the HAPs, FY 2005 will be a critical year for implementing the national air toxics strategy. The Agency will continue its transition from a technology-based to a risk-based control program. The Agency is still required to set technology-based standards for area sources.

In FY 2005, EPA will, as required by the Clean Air Act, continue the extensive residual risk analyses for already promulgated maximum achievable control technology (MACT) standards to determine if additional standards are necessary to reduce the remaining risks from these sources. The Agency will continue to develop the state, local, and Tribal component of the Air Toxics Program so that state, local, and Tribal agencies can address emission issues that are of concern on a state-wide, area-wide, or community-wide basis. As part of this effort, EPA will continue to support community assessment and risk reduction projects. The EPA will release an integrated final version of the national emission inventory (NEI) using data collected from 2002. This integrated inventory will include air toxics emissions data for analyzing public health risks from air toxics and strategies to reduce them, and to manage the risks posed by air toxics emission. The Agency will continue to develop the national ambient air toxic network to improve characterization of both national and community air toxic levels. Also in FY 2005, we will be promulgating the Utility Mercury Reductions Rule. This program may utilize a cap and trade approach that would allow emissions trading in lieu of a MACT standard which is less flexible and more costly. (The proposed rule seeks comment on both the cap and trade and MACT approaches.)

In FY 2005, EPA will establish and implement Federal standards to require cleaner motor vehicles, nonroad equipment, locomotives, marine engines, and fuels that are cost-effective and technically feasible. The Agency will continue implementation of the Tier II and gasoline sulfur standards. The Agency will also continue work on the 2007 heavy-duty highway engine and diesel sulfur requirements. In addition, EPA is promulgating new standards and fuel requirements for nonroad diesel fuel that will take effect for new engines starting as early as 2008.

In addition, EPA will continue to monitor industry compliance with vehicle, engine, and fuel standards, and to proceed with advancements in vehicle emission control technologies. The type and amount of testing required at EPA's National Vehicle and Fuel Emissions Laboratory continues to expand greatly to meet the much more stringent and complex regulations for cars, heavy-duty diesel engines, and gasoline and diesel fuels.

Ensure Healthier Indoor Air

In FY 2005, EPA will build on the success of its national "Indoor Air Quality (IAQ) Tools for Schools" (TfS) program and expand implementation of this program to more schools. Adoption of EPA's low-cost/no-cost guidelines for proper operation and maintenance of school facilities results in healthier indoor environments for all students and staff, but is of particular help to children with asthma, lessening the degree to which they are exposed to indoor asthma triggers. By increasing the number of schools where TfS indoor air quality guidelines are adopted and implemented, healthier indoor air will be provided for over a million students, staff, and faculty.

EPA expects, as a result of Agency programs, that over three quarters of a million people will be living in healthier residential indoor environments in FY 2005. Part of meeting this goal includes expanding the Agency's successful education and outreach efforts to the public about sound indoor environmental management techniques with respect to asthma. In addition, the Agency will continue to focus on ways to assist the health-care community to raise its awareness of, and attention it pays to, indoor asthma triggers and their role in provoking asthma attacks in

those with the disease. EPA, in conjunction with the Department of Health and Human Services (HHS), will continue to seek opportunities to interact with managed care organizations and health insurers to promote effective asthma care practices and to encourage greater emphasis on avoidance of asthma triggers, as part of a comprehensive asthma treatment regimen.

Greenhouse Gases

The President's greenhouse gas program builds on the accomplishment of EPA's voluntary climate programs. EPA's voluntary climate change programs have made significant progress to date. However, opportunities remain to achieve further pollution reductions and energy bill savings from energy efficiency programs and greater use of cost-effective renewable energy. In the U.S., energy consumption causes more than 85 percent of the major air emissions such as NO_x, SO_2, and CO_2. At the same time, American families and businesses spend over $600 billion each year on energy bills.

In FY 2005, EPA will continue to build upon its successful partnership programs such as ENERGY STAR, the clean energy programs, Climate Leaders, SmartWay Transport Partnership, and Best Workplaces for Commuters programs. Under these innovative programs we will expand our work with companies to encourage them to take on new voluntary commitments to reduce greenhouse gas emissions.

Stratospheric Ozone

To protect the earth's stratospheric ozone layer in accordance with the United States' commitment to the Montreal Protocol, EPA will continue to regulate ozone-depleting compounds, foster the development and use of alternative chemicals in the U.S. and abroad, inform the public about the dangers of overexposure to UV radiation, and use pollution prevention strategies to require the recycling of ozone-depleting substances (ODS) and hydrofluorocarbons.

Radiation

In FY 2005, EPA will continue to protect people and the environment from harmful and avoidable exposure to radiation by oversight of radioactive waste disposal in the Waste Isolation Pilot Plant, setting protective limits on radioactive emissions, providing guidance and training to other Federal and state agencies in preparing for domestic emergencies and other incidents that may involve radiation, and develop guidance for cleaning up radioactively-contaminated Superfund sites. We will ensure that the Agency employs appropriate methods to manage radioactive releases and exposures. These include health-risk site assessments; risk modeling, cleanup, and waste management activities; voluntary programs to minimize exposure to radiation in commercial products and industrial applications; national environmental radiation monitoring; radiological emergency response; and provision of Federal guidance to our international, Federal, state, and local partners.

Enhance Science and Research

The Tropospheric Ozone and Particulate Matter (PM) Research Programs will upgrade methods and models to guide states in the development of State Implementation Plans (SIPs)

used to achieve the NAAQS. In FY 2005, the Agency will release an upgraded version of the Models-3 Community Multi-scale Air Quality (CMAQ) modeling system with upgraded mechanisms for speeding up the model run time. This will be an important tool for developing state and tribal SIPs. PM research will continue to strengthen the scientific basis for the periodic review of the PM NAAQS, through work that includes epidemiological and exposure studies. The PM program will also develop tools and methods to characterize PM sources and health effects that will move the Agency toward its objective of reducing Americans' exposure to PM. Important products of the FY 2005 PM research program will include improved receptor models and data on chemical compounds to help identify sources that contribute to ambient PM so that states and tribes can develop more effective control strategies

Air toxics research provides information on effects, exposure, and source characterization, as well as other data to quantify existing emissions and to identify key pollutants and strategies for cost-effective risk management. In FY 2005, research will focus on providing health hazard and exposure methods, data, and models to enable the Agency to reduce uncertainty in risk assessments, and the production of tools that enable national, regional, state, or local officials to identify and implement cost-effective approaches to reduce risks from sources of air toxics.

EXTERNAL FACTORS

Stakeholder participation: To achieve clean air, EPA relies on the cooperation of Federal, state, Tribal, and local government agencies; industry; non-profit organizations; and individuals. Success is far from guaranteed, even with the full participation of all stakeholders. EPA has significant work to accomplish just to reach the annual targets that lead to the longer-term health and environmental outcomes and improvements that are articulated in the Clean Air goal. Meeting the Clean Air goal necessitates a strong partnership among all the stakeholders, but in particular among the states, Tribes, and EPA; the Environmental Council of States; and organizations of state and local air pollution control officials. EPA will be working with various stakeholders to encourage new ways to meet the challenges of "cross regional" issues as well as to integrate programs to address airborne pollutants more efficiently.

Environmental factors: In developing clean air strategies, states, Tribes, and local governments assume normal meteorological patterns. As EPA develops standards and programs to achieve the Clean Air goal, it has to consider weather as a variable in the equation for implementing standards and meeting program goals. For example, even if an area is implementing a number of air pollution control programs under normal meteorological patterns, a hot humid summer may cause an area to exceed standards for days at a time, thereby exposing the public to unhealthy air.

Environmental Protection Agency

FY 2005 Annual Performance Plan and Congressional Justification

Clean Air and Global Climate Change

OBJECTIVE: Healthier Outdoor Air

Through 2010, EPA and its partners will protect human health and the environment by attaining and maintaining health-based air quality standards and reducing the risk from toxic air pollutants.

Resource Summary
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Healthier Outdoor Air	**$557,907.1**	**$579,059.2**	**$659,876.2**	**$80,817.1**
Environmental Program & Management	$231,825.3	$250,509.5	$261,196.7	$10,687.3
Science & Technology	$75,701.8	$81,059.9	$85,302.2	$4,242.3
State and Tribal Assistance Grants	$243,116.5	$239,600.0	$304,600.0	$65,000.0
Building and Facilities	$4,583.4	$4,645.2	$5003.2	$358.0
Inspector General	$2,680.1	$3,244.6	$3,774.1	$529.5
Total Workyears	1,706.6	1,751.5	1,765.9	14.4

Program Project
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Clean School Bus	$0.0	$1,500.0	$65,000.0	$63,500.0
Categorical Grant: State and Local Air Quality Management	$229,633.4	$228,550.0	$228,550.0	$0.0
Children and other Sensitive Populations	$50.6	$235.0	$127.0	($108.0)
Categorical Grant:Tribal Air Quality Management	$13,483.1	$11,050.0	$11,050.0	$0.0
Clean Air Allowance Trading Programs	$15,667.4	$21,814.9	$22,857.5	$1,042.6
Congressionally Mandated Projects	$12,724.8	$0.0	$0.0	$0.0
Federal Stationary Source Regulations	$19,120.1	$23,702.2	$24,302.0	$599.8
Federal Support for Air Quality Management	$92,966.1	$96,657.4	$102,849.9	$6,192.5
Federal Support for Air Toxics Program	$28,116.6	$28,655.1	$27,358.7	($1,296.4)
Federal Vehicle and Fuels Standards and Certification	$55,525.5	$60,446.8	$64,466.5	$4,019.7
International Capacity Building	$3,570.0	$1,541.3	$1,633.9	$92.6
Homeland Security: Critical Infrastructure Protection	$0.0	$1,106.2	$1,110.8	$4.6
Administrative Projects	$87,049.5	$103,800.3	$110,569.9	$6,769.7
TOTAL	**$557,907.1**	**$579,059.2**	**$659,876.2**	**$80,817.1**

FY 2005 REQUEST

EPA's strategy for achieving clean outdoor air includes a comprehensive, multi-pollutant approach that combines national and local measures, with implementation responsibilities carried out by the most appropriate and effective level of government. Problems with broad national or global impact - emissions from power generators, petroleum refineries, chemical plants, and other large sources, as well as pollution from motor vehicles and fuels - are best handled at the Federal level. States, Tribes, and local agencies can best address the regional and local air quality problems that remain after Federal measures have been fully applied. This approach allows for the use of traditional, regulatory tools, where appropriate, and enables EPA to implement innovative, market-based techniques - such as President Bush's Clear Skies Initiative or the suite of integrated air rules proposed in December 2003 - where most effective. These Federal programs help states and Tribes both meet National Ambient Air Quality Standards (NAAQS) and reduce public exposure to harmful levels of air toxics.

Under the Act, EPA has established NAAQS for six "criteria" pollutants: particulate matter (PM), ozone, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead. The Act also lists 188 pollutants that are categorized as Hazardous Air Pollutants (HAPs) or air toxics. Finally, EPA has established the Acid Rain Program required by the Act to reduce emissions of SO_2 and nitrogen oxides (NOx), that adversely affect the health of Americans and of our ecosystems.

The Clean Air Act requires states to develop State Implementation Plans (SIPs) to implement the six NAAQS. The Act authorizes Tribes to develop similar clean air plans. Also, the Act provides a framework for addressing air toxics at the local level. EPA works closely with public and private sector partners and stakeholders to develop the tools - such as monitoring, modeling, and emission inventories - that allow States, Tribes, and localities design programs to address local problems. States, Tribes, and localities may employ innovative approaches, such as diesel retrofits and community-based approaches for air toxics that are well suited to the local nature of these problems. EPA also provides capacity building training and support in order for its international partners to address air quality issues.

EPA implements the Healthier Outdoor Air Objective through eight Program/Projects. Three of the Program/Projects include primarily Federal measures:

1. Federal Stationary Source Regulations;
2. Clean Air Allowance Trading Programs; and
3. Federal Vehicle and Fuels Standards and Certification.

The other five Program/Projects primarily support, state, Tribal, and local efforts to meet NAAQS requirements and reduce public exposure to harmful levels of air toxics. These include:

4. Federal Support for Air Quality Management;
5. Federal Support for Air Toxics Programs;
6. Clean School Bus Initiative;
7. Categorical Grant: State and Local Air Quality Management; and
8. Categorical Grant: Tribal Air Quality Management.

Results to be Achieved under this Objective

Implementation of this objective will result in cleaner air for Americans. By 2010, the reductions in the levels of fine particles and ozone from Clear Skies and other air pollution control programs are projected to result in 7,900 fewer premature deaths and $55 billion in annual health and visibility benefits nationwide each year. New diesel truck and bus standards will reduce the level of sulfur in highway diesel fuel by 97 percent by 2006. Beginning in 2007, each new truck and bus will be more than 90 percent cleaner than current models, resulting in annual emission reductions of 2.6 million tons of NOx and 109,000 tons of PM by 2030.[11] The non-road program will provide annual emission reductions of 825,000 tons of NOx and 125,000 tons of PM when fully implemented.[12]

Implementation of EPA's international programs will lead to an increase in the number of air quality management strategies established in key countries and regions and an increase in the amount and quality of information and technical capacity available for decision-makers. These strategies, information, and capacity will provide the necessary institutional framework for reductions of industrial and mobile source air pollution in key countries and regions, harmonization with U.S. standards, and reductions in long-range transport to the U.S.

Federal Stationary Source Regulations

Under the Clean Air Act, EPA is responsible for setting, reviewing, and revising the NAAQS, as well as for setting emission standards for sources of air toxics. These national standards form the foundation for air quality management and air toxics programs implemented at the national, state, local and tribal levels, and establish goals that protect public health and the environment.

NAAQS Review: EPA is responsible for periodic review and revision, when necessary, of the NAAQS for the six "criteria" pollutants: PM, ozone, SO_2, NO_2, CO, and lead. Currently, EPA is reviewing the following NAAQS:

PM. Review of the PM NAAQS is well underway. EPA is currently developing drafts of the Staff Paper and health risk assessment and will complete them in FY 2004. In FY 2005, the Agency will propose whether to retain or revise the NAASQS for fine particulates ($PM_{2.5}$), and in FY 2006 will make a final decision.

Ozone. In FY 2004, EPA will carry out the exposure analysis and health risk assessment for the ozone NAAQS, in conjunction with development of the Staff Paper. The Agency will complete final work in FY 2005 and propose to retain or revise the ozone NAAQS in FY 2006. EPA will make a final decision on the standard by the court-ordered deadline of December 15, 2006.

[11] U.S. Environmental Protection Agency, Office of Air and Radiation. December 2000. Regulatory Announcement: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements. EPA420F-00-057. Washington, DC: GPA. Available online at http://www.epa.gov/otaq/regs/hd2007/frm/f00057.pdf. Date of Access: December 2, 2003.
[12] U.S. Environmental Protection Agency, Office of Air and Radiation. April 2003. *Regulatory Announcement: Public Health and Environmental Benefits of EPA's Proposed Program for Low-Emission Nonroad Diesel Engines and Fuel*. EPA420-F-03-010. Washington, DC: GPO. Available online at http://www.epa.gov/nonroad/f03010.pdf . Date of Access: December 2, 2003.

CO. EPA is currently reviewing the NAAQS for CO and has completed the CO Criteria Document. The Agency anticipates continuing work on the Staff Paper in FY 2004. After taking into account CASAC review and public comment, EPA will propose a decision or whether to retain or revise the standards.

Air Toxics: Air toxics or HAPs may have a number of health and environmental impacts when in the air or deposited on soils or surface waters. People exposed to certain toxic air pollutants at sufficient concentrations and for sufficient periods of time are at increased risk of cancer or other serious health effects. These health effects may include damage to the immune system, neurological system, reproductive system (e.g., reduced fertility), and/or developmental and/or respiratory problems. Numerous studies also conclude that air toxics contribute to birth defects, reproductive failure, and disease in animals, as well as humans. Persistent toxic air pollutants are of particular concern in aquatic ecosystems where pollutants may accumulate in sediments and biomagnify in tissues of animals at the top of the food chain to concentrations many times higher than in the water or air.

The Clean Air Act includes a variety of provisions that address air toxics from all categories of sources. The 188 HAPs listed in the Act are emitted from mobile sources, major stationary sources, and area stationary sources.[13] EPA also has classified diesel particulate matter and diesel exhaust organic gases as air toxics. Title II of the Act requires EPA to develop standards to control HAPs from motor vehicles and vehicle fuels. Title III provides authority to regulate HAPs from stationary sources. A major source is defined as a stationary sources or a group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAPs. An area source is defined as any stationary source of HAPs that is not a major source.

EPA's Air Toxics program has five elements:

1. Developing source-specific and sector-based Federal standards;
2. Carrying out national, regional, and community-based programs that focus on multi-media and cumulative risks;
3. Using actual, measured, and modeled data to set priorities and guide programs;
4. Filling toxicity data gaps; and
5. Providing public education and outreach.

Priorities for the Air Toxics program include:

- Implementing a residual risk program to address risks at facilities post-MACT standards; working to reduce toxics from mobile sources;
- Developing generally-available, control technology-based standards for the highest priority area source categories; and
- Working with stakeholders to identify and address the risk reductions that matter most to local citizens, and developing tools, training, handbooks, and websites to provide information on how to assess risks, convene multi-stakeholder groups to make local decisions, and steps to go through to reduce risks.

[13] http://www.epa.gov/ttn/atw/pollsour.html

EPA implements a two-phase program to reduce emissions of air toxics from major stationary sources. In the first phase, which is technology-based, EPA set Maximum Achievable Control Technology (MACT) standards for approximately 180 source categories emitting one or more of the 188 HAPs listed in the Act. MACT standards create a level playing field by requiring all major sources to achieve the level of control already being achieved by the better performing sources in each category. Although MACT standards are primarily for major sources, they also may address important area source categories, such as chrome electroplaters and secondary lead smelters that emit some of the most toxic pollutants.

When fully implemented, the MACT rules, in combination with efforts by states and industry, will decrease toxic emissions from large industrial facilities by 1.7 million tons per year or 63 percent from 1990-1993 baseline levels.[14] As of September 1, 2003, EPA had issued 92 standards for 168 source categories. The Agency plans to issue another four standards for six source categories by February 2004.

In the second phase, which is risk-based, EPA examines each MACT standard eight years after promulgation to determine if the health risk remaining from each industrial category is considered safe. EPA will develop more stringent residual risk standards, when appropriate, to reduce cancer and non-cancer health risks.

In FY 2005, EPA will continue residual risk analyses for already promulgated MACT standards to determine if additional, tighter standards are necessary to reduce the remaining health risks from these sources. EPA is working to develop the significant amounts of information (e.g., emissions, source characterization, exposures) required to determine whether additional standards are needed. EPA also is developing an approach so that only those facilities within a source category that pose risks at a level of concern will have to comply with these standards. Guidance is being developed so facilities can perform facility-by-facility risk analyses to determine whether they have low risks and are, therefore, already in compliance with the standards.

EPA also must set technology-based standards for select area sources. Area source categories currently constitute approximately 55 percent of the air toxics emissions.[15] Projections that include consideration of standards in place show that area source categories constitute a significant proportion of unaddressed emissions. Area sources are an important source because they frequently occur in clusters in congested areas with high populations. EPA is evaluating these sources and has started work on those with the greatest emissions and toxicity. As of September 1, 2003 the Agency has listed 70 area source categories that were required to be finalized in 2000. Standards for 14 of these source categories have been completed. EPA is negotiating promulgation dates for the remaining 56 source categories as part of settlement discussions.

In addition to these standards, EPA determined in December 2000 that regulation was necessary and appropriate for coal-fired and oil-fired electric utility steam generating units.

[14] The EMS-HAP (Emissions Modeling System for Hazardous Air Pollutants) is used to estimate annual emissions of air toxics for the 1996 NTI and 1999 NEI for HAPS (and for all years in-between). http://www.epa.gov/scram001/tt22.htm#aspen http://www.epa.gov/ttn/chief/emch/projection/emshap.html http://www.epa.gov/ttn/chief/emch/projection/emshap.html

[15] National Emission Inventory Data, http://www.epa.gov/ttn/chief/net/index.html

According to an existing settlement agreement, these regulations were proposed in December 2003[16] with scheduled promulgation in December 2004, and will bring these units into compliance by December 2007. The Utility Mercury Reduction Rule includes provisions for a cap and trade approach, consistent with the President's Clear Skies proposal, that would allow emissions trading in lieu of "maximum achievable control technology" (MACT). The proposed rule seeks comment on the two approaches for reducing the mercury emitted by coal-fired power plants.

Clean Air Allowance Trading Programs

EPA's strategy for achieving clean air includes a series of innovative market-based programs: the Clear Skies Initiative proposed by President Bush, the Interstate Air Quality Rule and Mercury Reduction Rule proposed by EPA in December 2003, the Acid Rain Program established by the 1990 amendments to the Clean Air Act, and the NO_x Budget Programs developed under the NO_x SIP Call (which, as of March, 2003 incorporates the initial NO_x Budget Program under the Northeast Ozone Transport Commission). The Acid Rain Program is designed to reduce SO_2 and NO_x emissions; the NOx Budget Programs address the interstate transport of ozone and NO_x. EPA will continue to implement the two established market-based programs while awaiting passage of Clear Skies legislation or promulgation of the Interstate Air Quality Rule and the Mercury Reduction Rule.

Clear Skies: The legislation proposed under the Clear Skies Act will take the best of what we have learned and modernize the existing Clean Air Act. Using a market-based approach, the Clear Skies Act will dramatically cut power plant emissions of three of the worst air pollutants – SO_2, NO_x, and mercury (Hg). Emissions of SO_2 and NO_x result in airborne fine particles ($PM_{2.5}$); reductions in emissions of these pollutants will reduce $PM_{2.5}$. EPA's approach builds upon the success of the Acid Rain cap-and-trade program created in 1990. The Acid Rain Program has reduced more pollution in the last decade than any of the Clean Air Act command-and-control programs for stationary sources and achieved these reductions at 25 percent of the projected costs at the inception of the program.

The Clear Skies Act, as proposed, will achieve substantially greater reductions in air pollution from the power sector more quickly and with more certainty than the existing Clean Air Act. The Initiative requires mandatory cuts of SO_2, NO_x, and Hg by an average of 70 percent from year 2000 levels and ensures that these levels are achieved and sustained through caps on emissions. The alternative approach, based on the proposed Interstate Air Quality Rule and the Utility Mercury Reduction Rule, would also achieve significant reductions in air pollution from the power sector, absent new legislative authority.

The types of actions that the Agency would need to take for implementation of either the Clear Skies Act or the rules proposed in December 2003 include:

(1) Prepare the data and tools for completing the rules and/or implementing the Act. Design a cap-and-trade program, promulgate rules, and develop implementing tools and mechanisms.

[16] http://www.epa.gov/mercury/actions.htm

(2) Support the rules with technical and economic analyses. Determine control technology options and investigate the regulatory impacts on the U.S. economy, the environment, small business, and local communities.

(3) Develop baselines and prepare to assess program benefits. Establish an integrated assessment program to include enhanced ambient and deposition monitoring and develop a baseline prior to implementation of the program.

(4) Ensure the program's credibility and results. Successful trading programs require accurate and consistent monitoring of emissions from affected sources. Investigate monitoring alternatives (particularly as they relate to mercury), propose performance specifications, and develop mercury monitoring protocols.

(5) Maximize flexibility for affected sources. Allow for optimum trading of emissions by building on existing Acid Rain electronic allowance trading and emissions reporting systems.

(6) Develop the operating infrastructure. Operation of this program will be dependent upon E-Gov infrastructure that must be developed. The data collection requirements must be determined and operating software and hardware specifications developed. Initial software development should also begin.

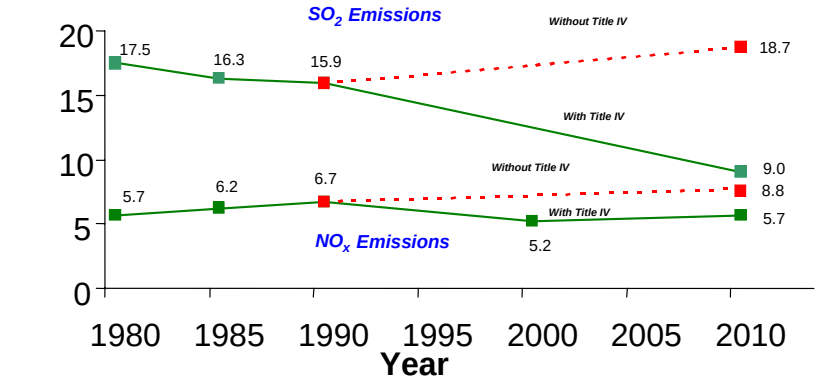
EPA projects that enactment and implementation of the Clear Skies Act, in combination with existing programs, will bring 246 of the counties currently not in attainment with the 8-hour ozone standard into compliance with the standard by 2010, leaving 44 counties predicted to monitor violation of this standard. For $PM_{2.5,}$ preliminary 1999-2001 data indicate that 129 counties monitor violation of this standard (are not in attainment). Under Clear Skies, in combination with existing programs, 87 of these counties are expected to attain the standard by 2010. By 2020, three additional counties are projected to come into attainment with the 8-hour ozone standard and 35 additional counties are projected to come into attainment with the $PM_{2.5}$ standard. Furthermore, emissions caps instituted over a period of time under Clear Skies (or the integrated Interstate Air Quality Rule) allow for flexible and cost-effective compliance with far greater certainty of achieving the anticipated environmental results. These integrated interstate air quality programs would eliminate costly source-by-source regulation and will most likely reduce the incidence of costly litigation, inspection, and enforcement actions while achieving results with compliance rates similar to those of the Acid Rain Program, which has emission reduction compliance rates of nearly 100 percent.

EPA projects benefits to human health could approach $110 billion annually by 2020, due primarily to avoided premature deaths. In addition, emission reductions resulting from Clear Skies will help to significantly address several other of our nation's major air pollution-related environmental problems caused by $PM_{2.5}$, ozone, acid rain, nitrogen deposition, and visibility impairment. Visibility benefits in select national parks and wilderness areas are projected to be approximately $3 billion annually. Clear Skies offers the opportunity to significantly reduce the expected collective cost to the state and Federal environmental agencies of developing and implementing programs to address $PM_{2.5}$ and regional haze issues, not to mention the cost of regulated entities under the current Clean Air Act programs.

Acid Rain Program: Emissions of SO_2, mostly from electric power generation and other industrial sources, and NO_x, mostly from electric power generation sources and motor vehicles, react in the atmosphere and fall to earth as acid deposition or "acid rain." Acid rain causes acidification of soils, lakes, and streams, making the water unsuitable for some fish and other wildlife and contributing to the damage of trees at high elevations. Acid rain also speeds the decay of buildings, statues, and sculptures that are part of our national heritage. Before falling to earth, SO_2 and NO_x gases form fine particles that adversely affect human health by contributing to premature deaths, chronic bronchitis, and other respiratory problems. The fine particles also contribute to reduced visibility and impair some of our most scenic vistas at national parks. Acid rain and its precursor SO_2 and NO_x emissions are carried by the wind, sometimes hundreds of miles, across state and national borders. NO_x emissions also are a major precursor of ozone, which contribute to asthma and other respiratory illnesses and damages crops, forests, and materials. NO_x deposition also contributes to eutrophication of coastal waters, such as the Chesapeake Bay and Tampa Bay.

Title IV

Utility SO_2 and NO_X Emissions Reductions



Source: U.S. EPA. Office of the Chief Financial Officer. *EPA Strategic Plan*. EPA-190-R-00-002. page 4. September 2000.

The Acid Rain Program, authorized under Title IV of the Clean Air Act Amendments of 1990, has numerous statutory deadlines. Title II of the Clean Air Act Amendments requires reductions in NO_x emissions from mobile sources. The U.S. also is committed to reductions in SO_2 and NO_x emissions under the U.S.-Canada Air Quality Agreement of 1991. EPA's Acid Rain Program uses market-based approaches to achieve these emission reductions. The Program provides affected sources with flexibility to meet required emission reductions at the lowest cost (both to industry and government). The SO_2 component features tradable units called "allowances" (one allowance authorizes the emission of one ton of SO_2), accurate and verifiable measurements of emissions, and a cap on total emissions. The Acid Rain Program continues to be recognized as a model for flexible and effective regulation, both in the U.S. and abroad.

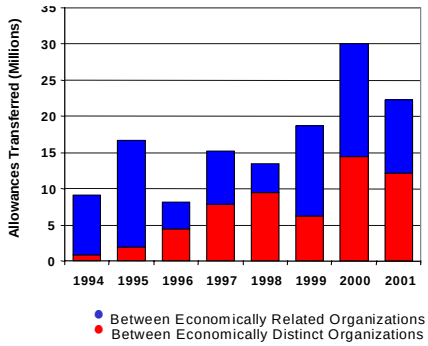
Major Acid Rain Program activities include: measurement, quality assurance, and tracking of SO_2, NO_x, and CO_2 emissions, as recorded by Continuous Emissions Monitors

(CEMs) or equivalent continuous monitoring methods at more than 3,000 reporting electric utility units; conducting field audits and certifying emissions monitors; recording transfers of emission allowances in the SO_2 allowance tracking system; and reconciling emissions and allowances for all affected sources to ensure compliance.

The Acid Rain Program developed through two phases. Phase I of the Program began in 1995 requiring SO_2 reductions from approximately 400 electric utility units. Phase I also required approximately 250 of these units to make NO_x reductions beginning in 1996. Phase II of the Program began in 2000 and required reductions in SO_2 emissions from more than 2,500 operating electric utility units (gas-fired, oil-fired, and coal-fired) and reductions in year-round NO_x emissions from approximately 1,000 coal-fired units. In addition, the number of affected sources is increasing steadily as new capacity is built into the system to meet the Nation's expanding energy demands. Since 2000, approximately 700 new operating sources have been added to the system, an increase of over 20 percent (many are peaking, not full-time load, units).

This growth has resulted in a steady increase in the number of units affected by the trading program and a significant increase in emissions tracking, SO_2 allowance trading, and account reconciliation activities conducted by EPA each year. To manage this workload, lower operating costs, and improve customer service, the Program has incorporated selected e-Gov IT practices compatible with the responsibility of administering the Allowance Tracking System (ATS) and the Emissions Tracking System (ETS). In 1999, the Program required direct modem or Internet transfer of emissions data. The ETS provides instant feedback to submitters identifying data reporting problems, format errors, and inconsistencies, so they can understand and correct problems promptly. In 2001, 4,900 allowance transfers that affected over 22 million SO_2 allowances were recorded in the ATS, the accounting system developed to track holdings of allowances. EPA launched the On-Line Allowance Transfer System (OATS) in December 2001. This timesaving electronic system enables allowance market participants to record trades directly on the Internet, rather than submitting paper forms. Approximately 90 percent of all allowance transfers are now completed on-line.

SO_2 Allowance Trading



Source: U.S. EPA. Office of Air and Radiation. Clean Air Markets Program. *EPA Acid Rain Program 2001 Progress Report*. EPA-430-R-02-009. page 13. November 2002

In addition to these operational activities, the Acid Rain Program is responsible for managing the Clean Air Status and Trends Network (CASTNet), a dry deposition monitoring network, as well as for providing critical operational support for the National Atmospheric Deposition Program (NADP), a wet deposition monitoring network. These monitoring efforts play a crucial role in the Program's ongoing assessment activities, including reporting outcomes under the Program Assessment Rating Tool (PART) and the Government Performance and Results Act (GPRA), and fulfilling assessment responsibilities under the US-Canada Air Quality Agreement and Title IX of the Clean Air Act. In addition, the Program provides analytical support for the interagency National Acid Precipitation Assessment Program (NAPAP). NAPAP coordinates Federal acid deposition research and monitoring of emissions, acidic deposition, and their effects, including assessing the costs and benefits of Title IV. In 2005, the Acid Rain Program will continue analyzing the costs and benefits of the Program for inclusion in NAPAP's Integrated Assessment Report.

EPA estimates that, when fully implemented in 2010, the SO_2 reductions alone under Title IV will provide $50 billion (1997 dollars) in health benefits (mostly from an estimated reduction in premature mortality of 9,000 cases per year) and $1 billion in additional benefits due to improved visibility from an expected 30 percent improvement in visibility at national parks in the eastern US.[17] The Acid Rain Program also will produce significant benefits in terms of lowered surface water acidity and less damage to materials and high-elevation forests. Nevertheless, after full implementation of the current program, significant residual risks will remain to human health, ecological systems, and quality of life. Thus, Clear Skies (or the alternative approach under the Interstate Air Quality Rule, proposed in December 2003) is needed to address this deficiency as well as issues related to visibility impairment and attainment of the NAAQS for fine particles and ozone.

A report, *Response of Surface Water Chemistry to the Clean Air Act Amendments of 1990,* released in January 2003 by EPA's Office of Research and Development (ORD) concludes that measurable improvements in surface water chemistry (lower sulfate concentrations and decreases in acidity) have resulted from reductions in emissions and in wet sulfate deposition under the Acid Rain Program. EPA with collaborators (researchers at universities, U.S. Geological Survey, and other organizations) conducted this assessment to determine if there have been reductions in the level of acidity in lakes and streams in five geographic areas of the Upper Midwest and Northeastern US – those areas most affected by acid rain. Study results indicate that in three of the five areas, one-quarter to one-third of lakes and streams previously affected by acid rain are no longer acidic, although they are still highly sensitive to future changes in deposition. In other areas, signs of recovery are not yet evident, suggesting that further reductions such as those proposed in the Clear Skies Act will further assist in ecosystem recovery.

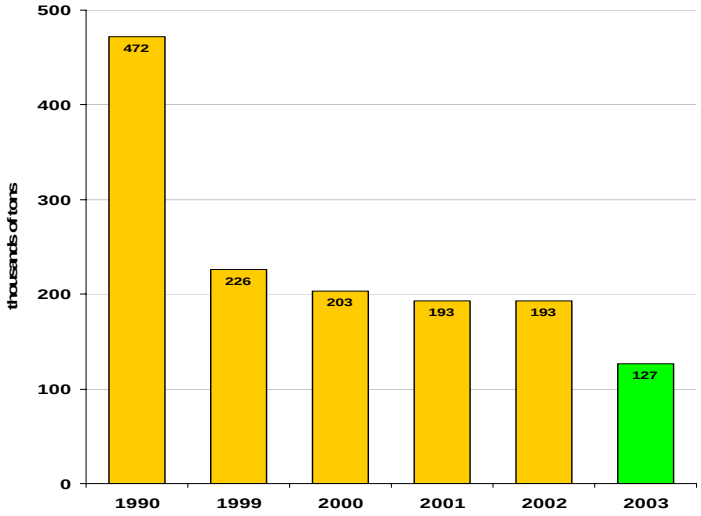
NO_x Budget Program: At the request of participating states, EPA will continue to operate the NO_x emission reduction and multistate trading program for controlling transported ozone and NO_x in the eastern United States. The initial NO_x Budget Program under the Ozone Transport Commission (OTC) went into effect in the summer of 1999. During the 2001 ozone season, nine states plus the District of Columbia were participating in this voluntary regional control program

[17] U.S. Environmental Protection Agency (EPA). The Benefits and Costs of the Clean Air Act 1990-2010: EPA Report to Congress. EPA: Washington, DC. November 1999.

for the ozone transport region (OTR). NO_x emissions from approximately 970 affected sources were reduced by over 250,000 tons (60 percent) from the 1990 baseline and 12 percent below the 2001 allowance allocations. Approximately the same reduction was maintained for the 2002 ozone season with emissions 11% below the 2002 allowance allocations. In March 2003, the OTC NO_x Budget Program ended as a separate entity, integrating fully with the broader regional NO_x Budget Program under the NO_x SIP Call.

Implementation of the NO_x SIP Call rule began in 2003 for the OTR states and will begin in 2004 for other states. Emissions data for affected sources in these states (with one exception) will be reported to the ETS beginning with the second quarter 2003. Approximately 1,000 sources (400 sources that have not reported previously) will begin submitting electronic emissions and monitor certification data. In 2004, the initial compliance year for the NO_x SIP Call, up to 2000 units in as many as 20 states and D.C. will be reporting seasonal NO_x data to ETS.

NO_x Emissions (OTR – Ozone Season)



Source:U.S. EPA. Office of Air and Radiation. Clean Air Markets Program with Ozone Transport Commission. *NO_x Budget Program 1999-2002 Progress Report*. EPA-430-R-03-900. March 2003.

EPA will continue to assist the states with implementation, especially related to the emissions trading program, compliance supplement pool, and monitoring. Following the 2003 and 2004 ozone seasons, EPA will conduct an analysis to assess and determine the actual emission reductions achieved. Initial compliance emission reductions from this regional program are required to begin in the summer ozone season of 2004. NO_x emission reductions from this program are projected to be approximately 800,000 tons per season.

Federal Vehicle and Fuel Standards and Certification

Despite great progress in achieving cleaner, healthier air, air pollution continues to be a widespread human health and environmental problem in the U.S., and mobile sources continue to be major contributors to outdoor air pollution. Over the past 30 years, EPA's national standards for vehicles, engines, and fuels have made major advances in reducing mobile source emissions.

However, continued increases in vehicle miles traveled have offset some of these advances, and additional work in a variety of areas is needed to provide further environmental benefits. In addition, EPA needs to focus on the implementation of recently promulgated programs to protect the environmental and health benefits expected in the future. Thus, much work remains to be done in FY 2005 to ensure the successful implementation of regulatory programs designed to address remaining mobile sources that contribute significantly to air pollution.

In the last few years, EPA has established important regulatory programs that will significantly reduce emissions from highway and non-road sources. It is critical for EPA to continue supporting the implementation activities of important environmental programs, such as the Tier II program, the 2007 Heavy-Duty (HD) standards, and the Non-road Diesel standards, in order to ensure the successful delivery of cleaner vehicles/equipment and cleaner fuel.

The Agency promulgated the Tier II program for Light-Duty Vehicles (LDVs) and Light-Duty Trucks (LDTs) in 2000. This program established new tailpipe standards for all passenger vehicles and new limits for sulfur in gasoline reducing NO_x emissions by 74 percent (i.e., 2 million tons per year by 2020 and nearly 3 million tons per year by 2030). The new tailpipe standards will begin in 2004, with a phase-in schedule between 2004 and 2007. The new gasoline sulfur requirements will also begin in 2004. The Tier II Program also will require a new corporate average for refineries, which is being introduced between 2005 and 2007.[18]

In 2001, the Agency promulgated new engine standards and diesel fuel requirements to significantly reduce emissions for highway HD trucks and buses. The new vehicle standards, beginning in 2007, will require that the level of sulfur in highway diesel fuel be reduced by 97 percent by 2006. As a result of this program, each new truck and bus will be more than 90 percent cleaner than current models, resulting in annual emission reductions of 2.6 million tons of NO_x and 109,000 tons of PM by 2030.[19] Thus, the Agency will be actively working on the implementation of this program in FY 2005. This work includes continued assessment of the development of clean engine and fuel technologies to evaluate progress toward implementation of the program.

For non-road diesel engines (i.e., those used in construction, agricultural, and industrial equipment), EPA is promulgating new standards and new fuel requirements for non-road diesel fuel in 2004. The new regulation will take effect for new engines starting as early as 2008. For the first time ever, advanced emission control systems will be incorporated into non-road equipment. In addition, the sulfur content of non-road diesel fuel will be significantly phased down from the current uncontrolled level of 3,400 ppm to 500 ppm beginning in 2007, and then to 15 ppm in 2010 – a 99 percent reduction.[20] These drastic changes in non-road engines and diesel fuel will require close scrutiny by the Agency to ensure a smooth transition into

[18] U.S. Environmental Protection Agency, Office of Air and Radiation. December 1999. *Regulatory Announcement: EPA's Program for Cleaner Vehicles and Cleaner Gasoline*. EPA420-F-99-051. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/ld-hwy/tier-2/frm/f99051.pdf . Date of Access: December 2, 2003.

[19] U.S. Environmental Protection Agency, Office of Air and Radiation. December 2000. *Regulatory Announcement: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/hd2007/frm/f00057.pdf . Date of Access: December 2, 2003.

[20] U.S. Environmental Protection Agency, Office of Air and Radiation. April 2003. *Regulatory Announcement: Summary of EPA's Proposed Program for Low Emission Nonroad Diesel Engines and Fuel*. EPA420-F-03-008. Washington, DC: GPO. Available online at http://www.epa.gov/nonroad/f03008.pdf . Date of Access: December 2, 2003.

compliance. This important program will provide annual emission reductions of 825,000 tons of NO_x and 125,000 tons of PM, when fully implemented.[21]

The successful implementation of the programs described above will ensure that air quality improvements and environmental and health benefits are accrued. EPA calculates that by 2030, compliance with the Tier II rule will prevent as many as 4,300 deaths, more than 10,000 cases of chronic and acute bronchitis, and tens of thousands of respiratory problems a year.[22] The emission reductions resulting from the 2007 Highway Heavy-Duty Engine Regulations will prevent as many as 8,300 premature deaths, more than 9,500 hospitalizations, and 1.5 million workdays lost.[23] The new Non-road Diesel program will prevent over 9,600 premature deaths, 8,300 hospitalizations, 16,000 heart attacks, 14,000 acute bronchitis attacks and 260,000 respiratory problems in children, and nearly a million workdays lost due to illness.[24]

In FY 2005, EPA also will continue implementing other important mobile source programs addressing ozone and PM. For example, the phase-in of emission standards for locomotives, which will result in more than 60 percent reduction in NO_x and more than 40 percent reduction in PM, began in 2000.[25] More stringent standards on locomotives will take effect in 2005. In FY 2002, EPA finalized regulations addressing emissions from a range of unregulated non-road sources, including industrial gasoline engines (e.g., forklifts and generators), recreational vehicles (e.g., snowmobiles), and recreational marine diesel engines. The new standards are expected to reduce hydrocarbon (HC) and NO_x emissions by nearly 80 percent when fully implemented.[26] The standards for industrial engines will begin to phase-in in 2004, while the standards for recreational vehicles and marine engines will begin in 2006.

In FY 2005, EPA will continue implementing the Phase II standards for gasoline handheld engines (e.g., trimmers, brush cutters, and chainsaws). The phase-in schedule of these new standards began with the 2002 model year, with more stringent standards coming into effect in 2005. This program will reduce HC and NO_x emissions by 70 percent, resulting in annual reductions of 500,000 tons of HC and NO_x by 2027.[27]

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[21] U.S. Environmental Protection Agency, Office of Air and Radiation. April 2003. *Regulatory Announcement: Public Health and Environmental Benefits of EPA's Proposed Program for Low-Emission Nonroad Diesel Engines and Fuel*. EPA420-F-03-010. Washington, DC: GPO. Available online at http://www.epa.gov/nonroad/f03010.pdf . Date of Access: December 2, 2003.

[22] U.S. Environmental Protection Agency, Office of Air and Radiation. December 1999. *Regulatory Announcement: EPA's Program for Cleaner Vehicles and Cleaner Gasoline*. EPA420-F-99-051. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/ld-hwy/tier-2/frm/f99051.pdf . Date of Access: December 2, 2003.

[23] U.S. Environmental Protection Agency, Office of Air and Radiation. December 2000. *Regulatory Announcement: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/hd2007/frm/f00057.pdf . Date of Access: December 2, 2003.

[24] U.S. Environmental Protection Agency, Office of Air and Radiation. April 2003. *Regulatory Announcement: Public Health and Environmental Benefits of EPA's Proposed Program for Low-Emission Nonroad Diesel Engines and Fuel*. EPA420-F-03-010. Washington, DC: GPO. Available online at http://www.epa.gov/nonroad/f03010.pdf . Date of Access: December 2, 2003.

[25] U.S. Environmental Protection Agency, Office of Air and Radiation. December 1997. *Regulatory Announcement: Final Emissions Standards for Locomotives*. EPA420-F-97-048. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/nonroad/locomotv/frm/42097048.pdf . Date of Access: December 2, 2003.

[26] U.S. Environmental Protection Agency, Office of Air and Radiation. December 2000. *Regulatory Announcement: Emission Standards for New Nonroad Engines*. EPA420-F-02-037. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/nonroad/2002/f02037.pdf . Date of Access: December 2, 2003.

[27] U.S. Environmental Protection Agency, Office of Air and Radiation. March 2000. *Regulatory Announcement: Final Phase 2 Standards for Small Spark-Ignition Handheld Engines*. EPA420-F-00-007. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/nonroad/equip-ld/hhsfrm/f00007.pdf . Date of Access: December 2, 2003.

In FY 2005, the Agency will continue to seek further reductions in mobile source emissions to attain and maintain the new ozone and PM NAAQS. For example, locomotives and commercial marine engines contribute significantly to NO_x and PM emission inventories in many urban areas and their contribution will grow over time compared to other mobile sources. It is estimated that in 2020, these engines will contribute to 20 percent of mobile source diesel PM and 30 percent of mobile source NO_x emissions.[28] To address these significant contributors of air pollution, the Agency is planning a proposal in 2005 that will apply advanced after-treatment technologies to these sources and require low sulfur in their fuel. For locomotives, the Agency also plans to address idle emissions and the possibility of retrofit PM requirements. In addition, the Agency is committed to further reduce emissions from large commercial ships with a final rule by April 2007.

EPA also plans to continue to address emissions from small gasoline engines (under 50 horsepower) in FY 2005. The requirement to develop a regulation addressing these engines was included in the FY 2004 Consolidated Appropriations Bill. The regulatory program would include exhaust and evaporative emission standards for marine engines, non-handheld engines (such as those used in lawnmowers), and handheld engines (such as those used in trimmers, chainsaws). The program would also include exhaust emission controls for small engines used in youth all-terrain vehicles (ATVs). According to the Appropriations Bill, the statutory deadline for this program would be December 2004 for a proposal, with a final rule in December 2005.

Currently, there are no on-board diagnostic (OBD) standards for engines used in heavy-duty (HD) trucks. Because of the recently promulgated 2007 HD truck standards, these vehicles will become more complex and dependent on electronic controls and exhaust emission control technology. Having OBD requirements in place will help ensure that the full benefits of the emission standards will be realized in-use, in particular by monitoring for failure of the exhaust emission control system. A proposal is planned for 2004, with a final rule in 2005. EPA will work together with California, Japan, and the European Union to develop world-harmonized OBD requirements. A similar OBD program is planned for non-road diesel engines, with a proposal expected in 2005.

In-use compliance is an important element of EPA's regulatory programs. EPA has entered into a settlement agreement with the Engine Manufacturers Association and several engine manufacturers that resolves several lawsuits related to non-compliance. Under this agreement, EPA is initiating a consultative process with regard to establishing through regulation an in-use compliance surveillance program for non-road diesel engines. This program is vital to ensuring that new engine standards are actually met in-use under real-world conditions. The program will deter the use of defeat devices, as well as detect emission malfunctions that could cause emissions to exceed standards. A proposal is planned for 2004 with a final rule in 2005.

Another important area of work in FY 2005 is mobile source air toxics. In FY 2001, EPA issued the Mobile Source Air Toxics Rule (MSAT) to address emissions of air toxics from mobile sources. This 2001 MSAT rule identified 21 mobile source air toxics, which include several volatile organic compounds and metals, as well as diesel particulate matter and diesel

[28] U.S. Environmental Protection Agency, Office of Air and Radiation. April 2003. *Draft Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines*. EPA420-F-03-008. Washington, DC: GPO. Available http://www.epa.gov/nonroad/r03008.pdf . Date of Access: December 8, 2003.

exhaust organic gases. The MSAT rule also evaluated the effectiveness of existing mobile source emission control programs in reducing highway emissions of the identified mobile source toxics. Air toxic reductions of about 1.4 million tons are expected between 1996 and 2020 from existing programs that reduce ozone and particulate matter (PM), including: the reformulated gasoline program, the national low emission vehicle program, the emission standards for passenger vehicles, trucks and buses, gasoline sulfur control requirements, and diesel fuel sulfur control requirements.

The 2001 MSAT rule committed the Agency to conduct further research and perform additional rulemaking to re-evaluate the need for and feasibility of additional toxics controls. EPA intends to finalize this rulemaking in FY 2005. EPA already has promulgated additional regulations that will reduce air toxic pollutants, including standards for large gasoline industrial equipment and recreational vehicles (finalized in 2002) and standards for non-road diesel equipment and fuel (to be finalized in 2004).

The MSAT rule EPA intends to finalize in FY 2005 will be based on synthesis and analysis of the ongoing analyses that EPA originally committed to in the 2001 rule's Technical Analysis Plan. This includes analyses of toxics emissions from non-road vehicles and equipment, estimation of exposure in microenvironments, consideration of the range of total public exposure to air toxics, and effectiveness and costs of control measures. EPA will be continuing to collect and analyze toxic emissions data from on-road and non-road mobile sources. In addition, the Agency will be analyzing data from several exposure assessment projects to characterize the role of mobile sources in creating toxic hot spots and high-end exposure. This is relevant to the FY 2005 MSAT rule as well as other policy development involving state/local and non-regulatory programs.

In addition to the assessment necessary to support the FY 2005 toxics rule, EPA will be conducting analyses to respond to mobile source air toxics issues that are becoming increasingly important. These include: near-roadway exposure, the mobile source contribution to emissions of persistent bioaccumulative toxics (such as mercury), and health effects from advanced technology vehicles.

The Agency's National Vehicle and Fuels Emissions Laboratory (NVFEL) provides critical support to EPA, the states, the fuels industry, the automobile industry, and non-road engine manufacturers by testing vehicles and engines for compliance with Federal clean air standards. The NVFEL will continue to conduct vehicle emission tests as part of the pre-production tests, certification audits, in-use assessments, and recall programs to support mobile source clean air programs. Tests are conducted on motor vehicles, heavy-duty engines, non-road engines, and fuels to: (1) certify and/or confirm that vehicles and engines meet Federal air emissions and fuel economy standards; (2) ensure engines comply with in-use requirements; and (3) ensure fuels, fuel additives, and exhaust compounds meet Federal standards. In FY 2005, EPA will continue to conduct testing activities for fuel economy, LDV and HD engine characterization, Tier II testing, reformulated gasoline, future fleets, OBD evaluations, certification audits, and recall programs.

EPA also will continue to conduct separate in-use testing on HD diesel engines to ascertain compliance with consent decrees related to violations of defeat device prohibitions and will expand its in-use presence to include non-consent decree engines and non-road diesel

engines. EPA will test HD diesel engines to support implementation of 2007 HD diesel requirements, non-road diesel engine rulemaking activities and develop Portable Emission Measurement Systems (PEMS). In addition, NVFEL will conduct energy efficiency tests of electric vehicles, including hybrids, in collaboration with the Department of Energy, as well as non-road vehicle emission testing in support of non-road regulatory development. EPA also will continue testing hydrogen fuel cell vehicles in support of demonstration programs, technical assessments, measurement method development, and compliance activities. To support on-going confirmatory and compliance programs, the NVFEL will conduct certification and fuel economy tests on LDV, LDT, and Light Heavy-Duty Vehicles (LHDV) and will conduct compliance tests on in-use LDVs and LDTs. NVFEL will also test LDV and HD engines for regulatory development.

The new Tier II (ultra-low emission vehicle) standards will increase the annual costs of generating and maintaining compliance program data, as well as create a completely new and different standards structure. The new Tier II program provides great flexibility, including corporate fleet averaging standards, multi-year phase-in, incentives for early innovation, and extensive banking and trading provisions. These provisions give manufacturers flexibility, but increase the EPA compliance program costs. In FY 2005, EPA also will begin to implement new durability provisions to replace regulations under the CAP 2000 program, in response to a D.C. Circuit Court of Appeals decision in FY 2002 that instructed the Agency to establish test methods and procedures by regulation.

Beginning in 2003-2004, manufacturers will shift product offerings toward extremely low emitting vehicles and cleaner diesel vehicles. Furthermore, new Federal test procedures took effect in 2003 for measuring emissions over test cycles to characterize the appropriate acceleration rates, accessory loads, and evaporative systems. These new requirements required the NVFEL laboratory to achieve greater data measurement stability/accuracy at extremely low levels as well as introduced new testing cycles and capabilities, resulting in increased annual operations and maintenance expenses for advanced testing systems and testing flexibilities. The new CAP 2000 database system to collect, process, store, and analyze a large volume of in-use data provided by the regulated industry also resulted in new annual maintenance and upgrade costs. The regulated industry depends on NVFEL laboratory accuracy to benchmark its own laboratories and to ensure consistent compliance stringency in the marketplace.

To ensure achievement of the goals of the Clean Air Act through Tier II and the 2004/2007 Heavy-Duty Diesel Engine standards, EPA completed an extensive equipment upgrade of vehicle and engine testing capabilities at the NVFEL. Included with this upgrade was the capability to test vehicles in four-wheel and all-wheel drive modes of operation. The implementation of a four-wheel drive dynamometer also allowed for the testing of hybrid vehicles with regenerative braking in a more representative fashion.

The mobile source compliance program will oversee more than 225 original equipment manufacturers to ensure that vehicles and engines (both on-highway and non-road) will meet the applicable emission standards throughout their useful life. The program issues nearly 2,200 certificates of conformity annually. Compliance is audited and ensured through pre-production certification and confirmatory testing, assembly line testing, various special audit programs, and in-use testing and recall. For light-duty vehicles and trucks, there also is a fuel economy compliance program, which in FY 2005 will issue about 1,000 fuel economy consumer labels,

data for the EPA/DOE Gas Mileage Guide and "gas guzzler" tax collection, and data to calculate the Corporate Average Fuel Economy (CAFÉ) values for all light-duty manufacturers.

EPA must continue to strengthen the new compliance-testing program to serve HD engine manufacturers certifying to the new 2004 emission standard requirements. This program must be as robust as the compliance program for LDVs and LDTs to prevent a recurrence of the use of emissions control defeat devices that has taken place in the past. HD engine manufacturers have requested that EPA establish a correlation program similar to the vehicle manufacturers' program. This will triple the size and operation of EPA's current correlation program.

In addition, non-road sources are a major certification and compliance workload priority, as new standards are now taking effect. In FY 2005, EPA will issue about 1,700 certificates for non-road sources up from zero in 1996. These non-road engines require unique test procedures because the range of products requires different testing, facility operation, and information technology costs to collect and process data and to calculate emissions levels.

For all mobile source industries, EPA will increase compliance and technical assistance. Since 1996 the number of manufacturers and the number of certificates issued by EPA has tripled. Complex requirements, phase-ins, and new test procedures have greatly increased the need for EPA-provided compliance and technical assistance to all mobile source industries, including: cars, trucks, large and small non-road equipment, forklifts, chainsaws, lawnmowers, generators, ground service equipment, recreational vehicles, commercial and recreational marine, and locomotives.

Another important element of the Agency's work in controlling air emissions is to ensure that accurate emission data is obtained from the different categories of mobile sources. In FY 2000-2001, the Agency increased its focus on the development of a portable emission measurement system that will allow the Agency to acquire in-use emission data in a cost-effective manner. From FY 2001 to FY 2004, EPA refined its in-use NO_x measurement capability and developed its PM measurement capability. In FY 2005, EPA will continue to test and develop the complete system to include air toxics measurement capability. The Agency plans to continue using portable systems to characterize in-use emissions from light-duty vehicles, heavy-duty highway vehicles, and non-road equipment. The newly acquired emission data will enhance EPA's emission models.

The Agency also will emphasize improvements in its transportation emission models in FY 2005. EPA has developed an architectural framework for a new generation model that will greatly improve the Agency's ability to support the development of emission control programs, as well as provide support to the states in their determination of program needs to meet air quality standards. The Agency will continue developing the new transportation emission model in FY 2005, as well as providing guidance and training in the use of mobile source models.

The Agency will continue to develop partnerships that emphasize the development of innovative transportation control and technology-based strategies and voluntary mobile source programs. The Agency will continue providing technical guidance for implementing the National Low Emission Vehicle program.

EPA also will continue implementing Phase II of the reformulated gasoline (RFG) program, which will result in additional HC, NO_x, and toxic emission reductions in 17 states and the District of Columbia. RFG is designed to substantially reduce vehicle emissions of ozone-forming and toxic pollutants, which is estimated to reduce VOC emissions by 27 percent, toxic emissions by 22 percent, and NO_x emissions by 6.8 percent.[29] This is the equivalent of taking 16 million vehicles that burn conventional gasoline off the road.[30]

EPA will continue to address issues associated with the use of oxygenates (e.g., MTBE and ethanol) in RFG and will review the industry's retail station survey plan. Several states have banned the use of MTBE and have submitted or may submit requests for waivers from the oxygen requirement of RFG. EPA will evaluate these waiver requests to determine whether a waiver from the requirement should be granted. In addition, 1-hour non-attainment areas that are bumped up to "severe" will be required to have RFG in place, and EPA will help implement the new programs as they become RFG-covered cities. The Agency will also continue to collect and review data submitted by manufacturers of motor fuels and fuel additives to assess whether fuels/additives different from conventional fuels (e.g. oxygenated fuels) cause any unexpected toxic effects.

Federal Support for Air Quality Management

EPA develops Federal measures that reduce emissions from stationary and mobile sources. States and Tribes must develop the additional clean air measures necessary to meet NAAQS. Current plans for NAAQS review are summarized below.

PM: The Agency will propose the PM-2.5 rule in 2004 and finalize it in late 2004. Area designations for PM-2.5 will be final by December 2004. EPA is working with States to develop strategies that will be effective in reducing emissions as well as voluntary actions that can be implemented early to provide for the health protection sooner than required under the Act. The Agency is coordinating its efforts to implement the ozone and PM-2.5 standards with the Regional Haze rule to maximize the ability of the States, Tribes and regulated community to respond to these requirements in an integrated fashion.

A major focus of the PM program in FY 2005 will be to complete the assessment of $PM_{2.5}$ as it moves from point, area, and mobile sources and source regions to downwind areas and to identify major contributing sources of precursor pollutant emissions (e.g., SO_x, NO_x). The Agency proposed an Interstate Air Quality Rule to reduce emissions of SO2 and NOx in the eastern U.S. This is an important component of EPA's efforts to implement the new NAAQS for fine particles and 8-hour ozone. The Agency also proposed a rule for implementing the transportation conformity program under the new NAAQS and expects to publish a final rule in FY 2004.

Ozone: EPA will continue to implement the national program for the 1-hour ozone standard, providing technical support to states required to submit mid-course reviews in 2004. This includes preparing example model applications, 10-year trends analyses, and other factors

[29] "Protection of Environment." Code of Federal Regulations. 2003 ed. Title 40, Pt. 80, Sec. 80.41 (f).
[30] U.S. Environmental Protection Agency, Office of Air and Radiation. February 2002. *Reformulated Gasoline Transition Fact Sheet*. EPA420-F-02-001. Washington, DC: GPO. Available online at http://www.epa.gov/otaq/regs/fuels/rfg/f02001.pdf .. Date of Access: December 2, 2003.

that can be used as part of the weight-of-evidence relative to demonstrating progress in attainment. EPA will review 1-hour data for the purpose of publishing determinations of attainment and to support redesignation from non-attainment. Where air quality data show that a non-attainment area has failed to meet its required attainment date, EPA will implement the reclassification provisions in the Clean Air Act.

EPA proposed a rule for implementing the 8-hr ozone NAAQS in June 2003[31] and expects to publish a final rule in 2004. In FY 2003, states and Tribes submitted recommendations for non-attainment and attainment areas. EPA will review and modify the recommendations (working with the states and Tribes) and prepare designation rulemaking, which is scheduled to be completed by the court ordered deadline of April 15, 2004. As mentioned above, EPA also proposed a rule for implementing the transportation conformity program under the new ozone and particulate matter NAAQS. In FY 2004, EPA will also propose changes to the regulations governing vehicle Inspection and Maintenance (I/M) under the 8-hour ozone NAAQS. The Agency expects to publish the final changes in FY 2005.

EPA will announce its plan to review and possibly revise its policy on the reactivity of VOCs in FY 2004, seeking input from stakeholders. The review and potential revision of this policy will address the impact of the policy on other environmental concerns, such as the impact on PM emissions, toxicity, ozone depletion, global warming, and water quality to assure an integrated, holistic approach. In FY 2004 and 2005 we will be addressing these impacts through guidance documents and where appropriate issuing rules.

SO_2: Currently, there are only a limited number of areas that do not monitor attainment of the SO2 standard. EPA and States will continue the implementation program currently in place. EPA will also continue to evaluate data encouraging States that show high short-term peaks to continue monitoring.

CO: Improvements in vehicle and emissions control technology have greatly reduced emissions of carbon monoxide. EPA is currently involved in review of the CO NAAQS standard as described under work on federal stationary source regulations.

Lead: Human exposure to lead in the ambient air has been significantly reduced as a result of the phase-out of lead in gasoline. EPA will continue a relatively low level of on-going work, emphasizing the few remaining problems in the vicinity of sources such as battery plants and lead smelters.

Supporting States and Tribes: In providing support to states and Tribes, EPA will give priority to attaining the NAAQS for $PM_{2.5}$ and ozone. EPA will review and finalize the attainment/non-attainment area designation recommendations from the states and Tribes. The Agency will complete the implementation rules that will guide the states and Tribes in the development of their implementation plans. EPA also will work with states and local areas to develop control strategies to reduce emissions of $PM_{2.5,}$ ozone and their precursors. The focus will be on early reductions and innovative strategies that can provide the nation with public health benefits sooner. EPA will work directly with areas having the greatest problem in meeting the standards, using new, innovative approaches to achieve early emission reductions.

[31] 68 FR 32802

These programs have the potential to provide substantial public health benefits as a result of early planning, implementation, and emissions reduction leading to expeditious attainment and maintenance of the NAAQS for ozone and PM-2.5.

Early Action Compacts for implementing the 8-hour ozone standard will play an important role in the national ozone management program for FY 2005.[32] The purpose of this program is to support and reward voluntary, early emission reductions to reduce ozone around the country. Through these Early Action Compacts, EPA is supporting the innovative efforts of 33 communities around the country that have pledged to reduce air pollution ahead of the deadlines under the Clean Air Act. Communities with Early Action Compacts will voluntarily start reducing air pollution ahead of schedule. These communities will bring substantial and sustainable health and environmental improvements to their residents much sooner than would have been achieved without these agreements. By December 31, 2004, states with Compact areas are required to submit adopted measures for these areas to EPA as a SIP revision to satisfy one of the Compact milestones and to continue being eligible for a deferral from the effective date for non-attainment designation (for any Compact area that is designated non-attainment by April 15, 2004). EPA will continue tracking progress of all Compact areas.

EPA will continue to work with the States of North Carolina (NC) and South Carolina (SC) and local officials in the Charlotte, NC/Rock Hill, SC region to develop a model integrated air quality plan for the Central Carolinas Region. EPA's goal for this pilot project is to integrate efforts to address multiple air quality problems -- ground-level ozone, PM, and toxic air pollutants – and to incorporate energy, transportation, economic development, and land-use planning into a single, model plan that can be used in different areas across the country. EPA will provide technical support in air quality planning, transportation planning, modeling for criteria pollutants and air toxics as well as decision support tools for testing various options for integrated planning for clean air.

Air quality monitoring is essential to providing a firm scientific basis for designing the national clean air program and measuring the results of Federal, state, Tribal, and local efforts. EPA will continue to fund and oversee the national air quality monitoring network operated by states. The Agency is working with states, Tribes, and local agencies to develop an integrated ambient monitoring strategy that will refocus the existing air monitoring program towards current data collection needs for ozone, PM, and air toxics. This national monitoring strategy will provide agencies with more flexibility in designing their networks. The final strategy and proposed implementing rules will be issued in FY 2004. Final rules will be promulgated within one year. To ensure source and ambient monitoring measurements are credible, EPA will continue developing quality assurance protocols and conducting quality assurance audits. [33]

In FY 2005, EPA will continue to provide technical support to the states and Tribes to help implement and assess the effectiveness of alternative control strategies on local and regional air quality. Tools such as development of the national monitoring strategy, source characterization analyses, emission factors and emission inventories, statistical analyses and source apportionment techniques, quality assurance protocols and audits, and improved source testing and monitoring techniques will be developed. EPA will continue to analyze ambient

[32] www.epa.gov/ttn/naaqs/ozone/eac/
[33] National Air Monitoring Strategy, http://www.epa.gov/ttn/amtic/monitor.html

monitoring data to provide insight into how precursors contribute to the PM-2.5 and ozone problem. Additionally, EPA will evaluate pollutant management programs, develop emissions inventories to determine the most important sources of emissions, and conduct modeling to develop alternative national and/or local control strategies to attain the PM-2.5 and ozone standards. EPA, states, Tribes, and Regional Planning Organizations will work collaboratively in developing and improving urban and regional-scale numerical grid models and evaluating their accuracy and applicability to complex air quality issues, including international/border issues.

EPA will partner with states, Tribes, and local governments to create a comprehensive compliance program to ensure that vehicles and engines pollute less. EPA will use advanced in-use measurement techniques and other sources of in-use data to monitor the performance of OBD systems on vehicle models to make sure that OBD is a reliable check on the emissions systems as part of vehicle I/M programs. In FY 2004, basic and/or enhanced vehicle I/M testing was being performed in over 30 states with technical and programmatic guidance from EPA. In FY 2005, EPA will continue to assist states in incorporating OBD inspections into their I/M programs. EPA will also support states in evaluating I/M programs, as directed by the Clean Air Act and recommended by the National Academy of Sciences. With this information, EPA will work to establish an integrated information system that allows for assessment and action on those vehicles and engines that present the greatest environmental risk.

As part of implementing the ozone and PM standards, EPA plans to provide state and local governments with substantial assistance in implementing the conformity rule during this period, because the first conformity determinations for the new standards will be due in the spring of 2005. EPA will continue to ensure national consistency in adequacy findings for motor vehicle emissions budgets in air quality plans. In addition, EPA will work with states and local governments to ensure the technical integrity of the mobile source controls in the SIPs. EPA will also assist areas in identifying the most cost-effective control options available.

Through EPA's Air Pollution Training Institute (APTI), technical air pollution training is provided to state, Tribal, and local air agency professionals. The APTI facilitates professional development by enhancing the skills necessary to understand and implement environmental programs and policies. The training is provided through a variety of formats, including classroom and satellite courses hosted nationwide, self-instructional courses in print and Internet-based format.

Visibility Implementation: EPA's regional haze program is aimed at improving the visibility at our National Parks and Wilderness areas. Visibility is impaired by the same types of pollutants that EPA is addressing in the PM2.5, ozone, and Acid Rain programs. Because of regional variations in natural conditions which combine with man-made pollution to produce regional haze, EPA believes that regional haze should be addressed through a region-specific program that accounts for these variations. EPA will continue supporting Regional Planning Organizations concerned with regional haze and associated PM impacts through the set up and application of regional scale models.

In July of 1999, EPA promulgated a Regional Haze rule to address this problem.[34] On May 24, 2002, a decision by the DC Circuit Court vacated EPA's proposed Best Available Retrofit Technology (BART) requirements within the Regional Haze rule. As a result of this decision, BART guidelines are expected to be re-proposed in FY 2004, with a final rulemaking to be issued in FY 2005. The rulemaking will include guidance on determining individual facilities' contribution to haze versus cumulative contribution and on evaluating "reasonable progress" control strategies under the Regional Haze rule.

EPA also will continue working with the United States Department of Agriculture (USDA) to develop a data system linking wildland and prescribed fire emission tracking systems and supporting databases used to assess air quality impacts and improve emission models. While EPA acknowledges the use of fire as an efficient and economical land management tool in maintaining the health of fire-tolerant and fire-dependent plant and animal ecosystems, EPA continues to work with Federal land management agencies to address the effective use of fire while minimizing public health and air quality impacts. EPA also continues to work with USDA and the Department of the Interior to include EPA data needs in the national fire database. EPA collaborates with the Departments of Agriculture and Interior on identifying and developing innovative information technologies to provide the land management community with tools to improve burn planning and air quality management.

EPA will continue assisting states and Tribes with regional scale models, including identifying meteorological and emissions inputs and developing emission projections. These model applications will provide the basis for assessing regional emission control strategies for $PM_{2.5}$ SIPs, and regional haze goals. The strategies for improving visibility will provide additional health and welfare benefits, since many of the pollutants that lead to visibility impairment also contribute to PM, ozone, and acidic deposition. EPA estimates that when the regional haze goals are fully achieved in 60 years, additional benefits will be worth up to $20 billion per year.

Cross-Pollutant Operating Permits and New Source Review (NSR): In FY 2004, EPA will continue efforts to finalize the certain monitoring requirements rule by mid-January 2004 and to develop additional rules on periodic monitoring and on monitoring issues in underlying Federal and state rules. EPA will also continue to provide technical support to states, Tribes, and local agencies on the permit program. By December 2003, states and local agencies were to have completed issuance of the first round of Part 70 permits. As of October 1, 2003, 82 percent of all initial permits had been issued with a projection of this rising to 95 percent by December 2003. In FY 2004, the EPA intends, with assistance from state and local permitting authorities, to continue to address permit issuance with a focus on permit renewals EPA plans to continue its 4-year effort of evaluating all state permitting programs. The EPA will expand training and technical support efforts to ensure smooth incorporation into operating permits of rules that have recently become effective. In FY 2004, efforts on a web-based Title V training effort for citizens will be completed. By early FY 2005, the EPA will decide if area sources subject to six MACT standards will need to obtain Title V permits.

In FY 2003, the EPA promulgated the final Prevention of Significant Deterioration (PSD) and non-attainment NSR rule. This rule, which was published in the *Federal Register* on

[34] 64 FR 35714

December 31, 2002,[35] finalized five reforms to the PSD and NSR programs that will streamline the program, and remove barriers and create incentives for environmentally beneficial projects. The EPA promulgated additional changes on March 10, 2003 incorporating these changes for states with NSR/PSD delegation[36]. The final rules became effective in March 2003. On November 7, 2003, EPA completed its response to a number of petitions requesting EPA to reconsider these rules[37]. Although the rulemaking is now complete, it remains under legal challenge, and this litigation will be moving forward during FY 2004 and likely 2005.

During FY 2004, the EPA will continue work on additional improvements to the NSR program. In FY 2003, the EPA proposed a definition for "routine maintenance" that would add certainty for sources and states (December 31, 2002)[38]. The EPA finalized the equipment replacement provisions of this proposal on October 27, 2003[39]. EPA will determine whether additional action is needed on other parts of this proposal.

In FY 2004 and FY 2005, the EPA will work with states to implement these revisions to the PSD and NSR rules. In states that administer Federal NSR and PSD rules under delegation agreements with EPA, the EPA will work with states to complete updates to the delegation agreements and to begin implementing the revised rules. In states that administer their own NSR and PSD rules, as approved into their SIPs by EPA, the EPA will work with states to ensure that new rules are adopted by states and approved by the EPA consistent with the revised rules. Changes to these rules must be adopted within 3 years, (i.e., by FY 2006).

In FY 2005, EPA will complete the 2-year cooperative agreement supported by the RACT/BACT/LAER Clearinghouse (RBLC) to fully implement the New and Emerging Air Technology (NEAT) Web database as a self-sustaining data source. In addition, EPA will continue to maintain, operate and acquire and enter data into the RBLC. In FY 2004, the EPA will complete work integrating the RBLC Web data base with other EPA data bases that contain data on air emission sources and reduce the number of RBLC data fields by approximately 40 percent to lower the resource burden on state and local agency and EPA staff. In FY 2003, the Clearinghouse completed the acquisition and entry of missing permits issued in the last 10 years (begun in 2002), awarded the NEAT cooperative agreement, and implemented many complex system improvements.

Federal Support for Air Toxics Programs

EPA has a number of programs to provide information and tools to communities in reducing air toxics emissions and risk.

Reductions in the total annual emissions of HAPs are compiled in EPA's National Emissions Inventory (NEI)[40]. The NEI provides only a crude indicator of reductions in population exposure and generally does not capture local scale risks. To provide this additional information, EPA has an ongoing comprehensive evaluation of air toxics called the National Air

[35] 67 FR 80186
[36] 68 FR 11316
[37] 68 FR 63021
[38] 67 FR 80920
[39] 68 FR 61248
[40] National Emission Inventory Data, http://www.epa.gov/ttn/chief/net/index.html

Toxics Assessment (NATA). NATA began with emissions data for 1996, estimated ambient concentrations for 33 HAPs in each of the approximately 62,000 census tracts nationwide, estimated average exposures to people, and calculated the potential cancer and non-cancer risks associated with those exposures. This ongoing assessment has been reviewed by the Science Advisory Board (SAB) and by state and local agencies. The NATA information is used by the EPA air toxics program to help set priorities, measure progress against goals, and develop study plans for more detailed local assessments, which will help identify the potentially higher exposures (i.e., hotspots) that may exist in urban environments and link these concerns to local risk reductions. The NATA is updated periodically.

In FY 2005, EPA will assemble an air toxic version of the NEI for the year 2002, which can be used by EPA, states, and others to analyze the public health risks from air toxics and strategies, and to manage that risk. The Agency will work with partners to develop improved emission factors. This effort will include gathering improved activity databases and using geographic information systems (GISs) and satellite remote sensing, where possible, for key point, area, mobile, and fugitive source categories and global emission events. In FY 2005, EPA will continue to update NATA.

EPA will continue to work with state and local agencies in a joint Air Toxics Monitoring Steering Committee to implement a national air toxics monitoring network. The SAB expressed clear support to the Steering Committee's approach for developing this capacity through monitoring pilots carried out under the sponsorship of the Committee. The data analysis phase of the initial assessment work, reflected in a 10-city air toxics monitoring pilot project, was completed in mid-2003. Data from this effort will be used to complete the design of a network for a national air toxics characterization by early calendar year 2004. The Steering Committee developed an initial design based on a limited, strategic network of national sites, coupled with more extensive community-scale monitoring, to provide the most representative assessment of the nation's air toxic pollution and enable EPA to better gauge the success of Agency efforts in reducing overall risks from air toxics.[41]

In FY 2005, EPA will continue to develop the state, local, and Tribal component of the Air Toxics Program so state, local and Tribal agencies can address emission issues that are of concern on a state-wide, area-wide, or community-wide basis. As part of this effort, EPA will continue to support community assessment and risk reduction projects. Community assessments are conducted to characterize the level of risk from toxic pollutants in specific areas. The geographic areas evaluated can vary from a neighborhood to entire towns and cities. EPA will provide information to states and communities through case examples, documents, websites, and workshops on tools to help them in conducting assessments and identifying risk reduction strategies. This will allow state, local and Tribal governments, industry, public interest groups, and local citizens to work together to determine if actions are needed, and if so, what should be done. EPA will also compile and analyze the information collected from the community assessments and use it to better characterize risk and assess priorities for further action.

Although EPA recently promulgated new rules regulating diesel emissions, the benefits of these rules will not be realized for at least five years. In the meantime, older, dirtier vehicles,

[41] Draft National Air Toxics Trends Sites Technical Assistance Document, http://www.epa.gov/ttn/amtic/files/ambient/airtox/drafttad.pdf

often on the road for a million miles or more, will continue to adversely affect the nation's health. To date, voluntary diesel retrofit projects have resulted in over 150,000 commitments to retrofit diesel engines, equivalent to reductions of approximately 60,000 tons of harmful pollution. During FY 2002, through this program, EPA worked with fuel companies to begin delivering ultra-low sulfur diesel fuel to centrally fueled fleets throughout certain parts of the country - four years before it is required. EPA has also developed several emissions testing protocols that will provide potential purchasers of emission control technology a consistent, third party evaluation of emission control products. EPA has developed partnerships with state and local governments, industry, and private companies to create project teams to help fleet owners create the most cost-effective retrofit programs.

EPA will also continue to provide technical expertise and support to state, local, and Tribal air toxics programs in assessing and reducing mobile source air toxics. This support includes models and other assessment tools; guidance on the application of such tools for evaluating impacts of proposed transportation facilities and the benefits of voluntary mobile source control programs; and education and outreach materials.

Through increased data collection efforts on air toxics in FY 2005, EPA also will be focusing on local hotspots and providing support on environmental justice issues. The Agency will evaluate and improve local-scale modeling efforts to support local evaluations or community assessments. The EPA also plans to continue air deposition hot spot analyses for water quality problems. These analyses will utilize air dispersion and deposition modeling to identify the most likely emission sources contributing to the problem.

EPA has continued its efforts under the Air-Water Interface Work Plan to address and prevent adverse effects of atmospheric deposition to coastal and inland waterways (i.e., Great Waters http://www.epa.gov/oar/oaqps/gr8water/). This work involves collaboration within EPA offices and with the National Oceanic and Atmospheric Administration (NOAA). In FY 2004, EPA is updating the Air-Water Interface Work Plan and will continue to implement it in FY 2005. These efforts involve the development and support of multi-media approaches to reduce risk and achieve water quality standards, such as enhancing technical tools and developing demonstration projects that facilitate Federal, state, Tribal and Regional deposition reduction strategies. The EPA will also provide up-to-date information regarding air deposition, emission sources, monitoring technologies, and toxic effects through education and outreach efforts. Planned outreach efforts include both synthesizing current trends information and sponsoring workshops/conferences.

Urban encroachment on farming communities and a growing number of large animal feeding operations (AFOs) have resulted in increased citizen complaints and rising concerns that air emissions from AFOs may have impacts on the environment and public health. At the present time, the EPA does not have emission factors sufficient to support regulatory determinations for animal agriculture. In some cases, there may not even be adequate technical approaches for characterizing the emissions.

EPA contracted the National Academy of Sciences (NAS) to review the scientific issues and make recommendations related to characterization of the swine, beef, dairy, and poultry AFO industries; measuring and estimating emissions; and analyzing potential best management

practices, including costs and technological feasibility. The NAS findings.[42] identified numerous deficiencies in EPA's methodologies and technical tools for estimating emissions for this industry. As a result of the NAS study, EPA is working with industry, the US Department of Agriculture (USDA), academia, and non-governmental organizations to develop a two year monitoring program to fill data gaps in the emission estimates. EPA in partnership with USDA, is prioritizing a research agenda to ensure critical research is initiated immediately. Concurrent with the monitoring program, in FY 2004, EPA is beginning the development of a regulation for AFOs. The Agency will prepare an announcement of its strategy and hold public meetings around the country. Following public comments, a proposed rule will be drafted.

In FY 2005, the Agency will continue the two year monitoring program and development of a final rule. The Agency will also develop various non-regulatory approaches to reduce air emissions from AFOs, including voluntary measures, Agency guidance materials, training and outreach. EPA will continue to work cooperatively with the agricultural industry, academia, the USDA, and the Congressionally established Agricultural Air Quality Task Force to develop scientifically valid emission estimates from AFOs for PM, PM10, PM2.5, hydrogen sulfide, ammonia, and volatile organic compounds (VOCs).

Clean School Bus Initiative

In FY 2005, EPA will expand its efforts to help create voluntary diesel retrofit projects to reduce diesel emissions from school buses. In FY 2003, the Agency launched the Clean School Bus USA initiative. This program will help ensure that school buses – which are the safest way for kids to get to school – are also the cleanest possible transportation for this generation of school children.

More than 24 million children in the U.S. ride a bus to and from school every day. Because school buses often remain in service for 20 or more years, this program will help equip our nation's school bus fleet with low-emission technologies and practices sooner than would otherwise occur through bus fleet turnover. Older buses can now be equipped with safe, affordable and more effective technology that will reduce emissions to very low levels – some that will be close to the performance standards required for new bus engines starting in 2007. The expanded program provides grants to governmental entities to replace pre-1991 school buses with new clean school buses offering state-of-the-art emission control and safety features and to retrofit post-1990 school buses with similar advanced emission controls. Clean School Bus USA brings together school districts and administrators, bus-fleet operators, health advocates, fuel providers, bus manufacturers and emissions-technology innovators to craft a collaborative, cost-effective program to protect the health of school children and the public.

Categorical Grant: State and Local Air Quality Management

This program funds over 100 state and local agencies to implement the requirements of the Clean Air Act Amendments described above. It also funds regional planning organizations to develop the regional haze implementation strategies. Funding for the development and maintenance of ambient air monitoring networks is also included in this program/project.

[42] http://www.nap.edu/catalog/10586.html

Categorical Grant: Tribal Air Quality Management

This program funds Tribal bodies to build their capacity and develop the measures needed to implement the Clean Air Act Amendments as described above.

International Capacity Building

Despite recent improvements, poor air quality is still a major concern throughout the world. In the developing world, urban air pollution has worsened in most large cities, a situation driven by population growth, industrialization and increased vehicle use. The World Health Organization (WHO) estimates that as many as 1.4 billion urban residents throughout the world breathe air exceeding the WHO air quality guidelines.[43]

The health consequences of air pollution are considerable. On a global basis, estimates of mortality due to outdoor air pollution run from around 200,000 to 570,000 people, representing about 0.4 to 1.1 percent of total annual deaths.[44] Moreover, air pollution contributes significantly to respiratory disease in children. In developing countries, acute respiratory infections (ARI) are the leading cause of death of children under the age of five.

Air pollution from other countries also affects the U.S. in a number of ways. First, it affects the U.S.'s ability to meet domestic air quality goals. Recent studies show the adverse impacts of air pollution from Asia on the U.S. Pacific coast, haze from fires in Central America and Mexico on the southern U.S., dust storms from Africa on Florida, and air pollutant flows between the US and Europe. Additionally, persistent and bioaccumulative pollutants are transported throughout the world. Finally, greenhouse gases, black carbon particles, and ozone from throughout the world contribute to global climate change.

To achieve our objective of preventing further degradation of air quality, both domestically and internationally, EPA will work to build the institutional capacity within developing countries and regionally to manage air pollution. EPA's focus will be on those countries that have demonstrated potential to affect human health and the environment globally and those that are leaders globally and regionally. Key regions and countries include Asia (China and India), NIS (Russia), Central America (Guatemala and Panama), South America (Chile and Brazil), Africa (Kenya, Nigeria, South Africa, Ghana, and Uganda), and our neighbors (Canada and Mexico). Specifically, EPA's international air quality capacity building programs will focus on:

- Development of credible information, innovative tools, and training on air quality, emissions, transport, and health impacts in order to build the infrastructure needed to address critical needs worldwide; and
- Development of regional strategies and collaborative work with partners, particularly with the World Bank's series of regional Clean Air Initiatives - Clean Air Initiative for Latin American Cities; Clean Air Initiative for Asian Cities, and Clean Air Initiative for Sub-Saharan African Cities.

[43] World Resources Institute, U.N Enviornmental Programme, U.N. Development Programme, and the World Bank. "1998-1999 World Resources: A Guide to the Global Environment." Oxford University Press, 1998.
[44] World Resources Institute, U.N Enviornmental Programme, U.N. Development Programme, and the World Bank. "1998-1999 World Resources: A Guide to the Global Environment." Oxford University Press, 1998.

EPA's most important strategy internationally is to build capacity over the long-term to manage air pollution. People and institutions are the foundation on which key programs are carried out and agreements implemented on-the-ground. Without this basic infrastructure, the programs will not be sustainable or replicable. As a thread that runs through the international air quality management program, capacity building programs will help enhance air quality in the U.S. and developing countries, leading to improvements in human health and the environment.

FY 2005 CHANGE FROM FY 2004

EPM

- (+$3,300,000): Increased funding is requested to develop the emission factors and inventories needed by the states to help them develop SIPs. To develop these tools, EPA will develop good testing data based $PM_{2.5}$ emission factors (with speciation profiles) for 3 to 6 industrial processes prioritized by their contribution to the $PM_{2.5}$ inventory. Coal and wood waste combustion, metals processing, mineral products and pulp and paper are candidates for this effort. Together these sources represent 65 percent of industrial sources of $PM_{2.5}$. We will also develop factors for processes where new testing was not required. This assumes that some emissions factors would be paid for by industry.

Additional funding will develop and improve the following products and services used by states as they develop their State Implementation Plans to implement the NAAQS:

- new methods for ambient measurements, including: (1) routine testing for nitric acid, ammonia, and true nitrogen dioxide, and (2) improved artifact-free aerosol carbon measurements (e.g., to better address abatement of diesel PM);
- source characterization for measuring: (1) VOC on an actual mass basis, (2) sulfuric acid/sulfur trioxide in the presence of ammonia, (3) higher-resolution fugitive ammonia emissions from sources such as animal feeding operations, and (4) low concentration/high flow rate NOx emissions from sources such as internal combustion engines and stationary gas turbines;
- emission factors for source types that contribute substantial quantities of carbonaceous $PM_{2.5}$. For each source category, factors will be developed for primary and filterable $PM_{2.5}$ and PM_{10}, condensable PM, SO_2, NOx, VOC, 16 specific Polycyclic Aromatic Hydrocarbons (PAH), and all other compounds and elements analyzed in the speciation trends network;
- highly resolved fire emission inventories for the entire U.S., to allow separation of their effects from local sources of carbonaceous $PM_{2.5}$;
- guidance and methods for using source-receptor analysis to untangle the contributions that different source types make to ambient concentrations of carbonaceous $PM_{2.5}$;
- speciation profiles for important source types, better reflecting eastern U.S. conditions than the profiles currently available;

- ready-to-use temporal and spatial allocation procedures and data files, so that air quality modeling with improved emission inventories can be used to assist in determining just how much contribution each source type makes to non-attainment; and
- information on the effectiveness and costs of regulatory and non-regulatory approaches for reducing emissions.

- (+$800,000): Increased funding is requested for the Clear Skies Initiative, a program that will cost-effectively reduce emissions of multiple pollutants from the power sector. This innovative approach addresses the major issues facing the Air Program – the adverse health and environmental effects caused by excessive $PM_{2.5}$, ozone, and air toxics in our communities – by replacing or streamlining the multitude of existing, uncoordinated regulatory approaches aimed at controlling emissions from the power sector with a single, national program that is comprehensive, cost-effective, and ensures emission reductions. With additional funding, we will establish an integrated assessment program to include enhanced ambient and deposition monitoring and develop a baseline prior to implementation of the program. Absent progress on enactment of Clear Skies legislation, we will direct these resources to comparable activities for the development and implementation of the Interstate Air Quality Rule.

- (-$1,500,000): Funding is redirected from the EPM appropriation Federal Support for Air Toxics Program to the STAG appropriation to support the Clean School Bus Initiative.

- (-$1,300,000): Funding is redirected to Federal Stationary Source Regulations and Federal Support for Air Quality Management. These resources will support the residual risk and areas source rules programs as well as implementation of the particulate matter and ozone NAAQS.

- There are additional increases for payroll, cost-of-living, and enrichment for existing FTE.

S&T

- (+$2,700,000): Increased funding is requested for an initiative to deliver more accurate and comprehensive mobile source modeling tools for states to use in identifying cost-effective control strategies as part of their SIP development for the new ozone and PM Air Quality Standards.

This initiative has two major components. First component is the collection of more accurate emission data from vehicles operating in the field, under real-world conditions. This effort would be the first attempt at designing a nationwide emissions study of light-duty and heavy-duty vehicles using portable emission measurement systems (PEMS). The PEMS system was developed by EPA personnel at the OAR Laboratory in Ann Arbor, MI, and is an extremely cost-effective and highly accurate method for collecting real-world data. The resulting data will allow EPA and states to better identify potential sources of uncontrolled emissions in the existing fleet and evaluate the effectiveness of current and future emission control programs. In addition, this program will improve the underlying data that is used in the emission models used by the states.

The second component of this effort is the development of a new generation model based on real-world data with the flexibility required to meet today's and future modeling needs for the states. This new model will allow the states to conduct modeling at all levels of resolution – from area-wide inventories to evaluating changes in emissions on a street corner (i.e., micro-scale modeling) as a result of a control strategy. This new generation of emission model will include all mobile source pollutants of interest, and can be used by states for all mobile source-modeling purposes.

- There are additional increases for payroll, cost-of-living, and enrichment for existing FTE.

STAG

- (+$65,000,000): In FY 2005, EPA will expand its efforts to help create voluntary diesel retrofit projects to reduce diesel emissions from school buses. This program will help ensure that school buses – which are the safest way for kids to get to school – also are the cleanest possible transportation for this generation of school children. EPA initially launched the program in April 2003 using $5 million in grant funding. The initial grant offering garnered 120 grant applications from every region of the country totaling nearly $60 million in requests and offering some $36 million in matching resources. EPA supported 17 of these projects with the given resources. By expanding this program, additional resources are available to communities for localized solutions that address an issue important to children and parents across the nation. The expanded program will provide grants to governmental entities to replace pre-1991 school buses with new clean school buses offering state-of-the-art emission control and safety features and to retrofit post-1990 school buses with similar advanced emission controls. Clean School Bus USA brings together school districts and administrators, bus-fleet operators, health advocates, fuel providers, bus manufacturers and emissions-technology innovators to craft a collaborative, cost-effective program to protect the health of school children and the public. With this new funding, EPA can greatly multiply the number of buses and children affected.

ANNUAL PERFORMANCE GOALS AND MEASURES

Reduce Air Toxic Emissions

In 2005 Air toxics emissions nationwide from stationary and mobile sources combined will be reduced by an additional 1% of the updated 1993 baseline of 6.0 million tons for a cumulative reduction of 38%.

In 2004 Air toxics emissions nationwide from stationary and mobile sources combined will be reduced by an additional 2% of the updated 1993 baseline of 6.0 million tons for a cumulative reduction of 37%.

In 2003 End-of-year- FY 2003 data will be available in late 2009 to verify that air toxics emissions nationwide from stationary and mobile sources combined will be reduced by an additional 1% of the updated 1993 baseline of 6.0 million tons for a cumulative reduction 35%.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Combined Stationary and Mobile Source Reductions in Air Toxics Emissions	Data Lag	2	1	Percent
Mobile Source Air Toxics Emissions Reduced		.71	.80	Million Tons
Stationary Source Air Toxics Emissions		1.59	1.59	Million

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Reduced				Tons
Major Sources, Area and All Other Air Toxics Emissions Reduced		+.13	+.14	Million Tons

Baseline: In 1993, the last year before the MACT standards and mobile source regulations developed under the Clean Air Act began to be implemented, stationary and mobile sources are now estimated to have emitted 6.0 million tons of air toxics. (EPA's prior estimate was 4.3 million tons and was updated with improved inventory data.) Air toxics emission data are revised every three years to generate inventories for the National Toxics Inventory (NTI). In the intervening years between the update of the NTI, the model EMS-HAP (Emissions Modeling System for Hazardous Air Pollutants) is used to estimate and project annual emissions of air toxics. EMS-HAP projects emissions, by adjusting point, area and mobile emission data to account for growth and emission reductions resulting from emission reduction scenarios such as the implementation of the Maximum Achievable Control Technology (MACT) standards.

Reduce SO2 Emissions

In 2005 Keep annual emissions below level authorized by allowance holdings and make progress towards achieving the year 2010 SO2 emissions cap for utilities. Annual emissions reduction target is 6.9 million tons from the 1980 baseline.

In 2004 Maintain or increase annual SO2 emission reduction of approximately 5 million tons from the 1980 baseline. Keep annual emissions below level authorized by allowance holdings and make progress towards achievement of Year 2010 SO2 emissions cap for utilities.

In 2003 End of year 2003 data will be available in the last quarter of 2004 to verify that annual emissions reduction of approximately 5 million tons from utility sources were maintained or increased during 2003.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
SO2 Emissions	Data Lag	5,000,000	6,900,000	Tons Reduced

Baseline: The base of comparison for assessing progress on the annual performance goal is the 1980 emissions baseline. The 1980 SO2 emissions inventory totals 17.4 million tons for electric utility sources. This inventory was developed by National Acid Precipitation Assessment Program (NAPAP) and used as the basis for reductions in Title IV of the Clean Air Act Amendments. This data is also contained in EPA's National Air Pollutant Emissions Trends Report. Statutory SO2 emissions cap for year 2010 and later is at 8.95 million tons which is approximately 8.5 million tons below 1980 emissions level. "Allowable SO2 emission level" consists of allowance allocations granted to sources each year under several provisions of the Act and additional allowances carried over, or banked, from previous years.

Reduce NOx Emissions

In 2003 End of year 2003 data will be available in Summer 2004 to verify that the Agency has achieved the annual emission reduction goal.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
NOx Reductions	Data Lag			Tons Reduced

Baseline: Performance Baseline: The base of comparison for assessing progress on this annual performance goal is emissions that would have occurred in the absence of Title IV of the Clean Air Act Amendments.

Reduce Exposure to Unhealthy Ozone Levels - 1 Hour

In 2005 The number of people living in areas with monitored ambient ozone concentrations below the NAAQS for the 1-hour ozone standard will increase by 4% (relative to 2004) for a cumulative total of 53% (relative to 1992).

In 2004 The number of people living in areas with monitored ambient ozone concentrations below the NAAQS for the 1-hour ozone standard will increase by 4% (relative to 2003) for a cumulative total of 47% (relative to 1992).

In 2003 Maintained healthy air quality for approx. 161.5 million people living in monitored areas attaining the ozone std; certified that 5 areas of the remaining 54 nonattainment areas have attained the 1-hour NAAQS for ozone thus increasing the no. of people living in areas with healthy air by 5.8 million.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Cumulative Percent Increase in the Number of People who Live in Areas with Ambient 1-hour Ozone Concentrations Below the Level of the NAAQS as Compared to 1992	Data Lag	47	53	Percent
Cumulative Percent Increase in the Number of Areas with Ambient 1-hour Ozone Concentrations Below the Level of the NAAQS as Compared to 1992	Data Lag	55	40	Percent
Total Number of People who Live in Areas Designated to Attainment of the Clean Air Standards for Ozone	161,485,900	167,300,000	174,562,000	People
Areas Designated to Attainment for the Ozone Standard	5	5	6	Areas
Additional People Living in Newly Designated Areas with Demonstrated Attainment of the Ozone Standard	5,800,000	5,800,000	7,276,790	People
VOCs Reduced from Mobile Sources	1,900,000	2,040,000	855,624	Tons
NOx Reduced from Mobile Sources	1,400,000	1,653,000	1,693,259	Tons

Baseline: The 1992 baseline for population is the population in areas not classified or designated as attainment for the clean air national ambient air quality standards. The 1992 baseline for areas is those areas that are designated as non-attainment of the NAAQs. Through FY 2003, 161,485,905 are living in areas designated to attainment; 51 areas are designated to attainment for this/these pollutants. The 2000 MOBILE 6 inventory is used as the baseline year for mobile source emissions as of FY 2005. The 2000 baseline for VOC emissions is 7.7 million tons; the baseline is 11.8 million tons. The 2000 MOBILE 6 inventory is used as the baseline year for mobile source emissions as of FY 2005. The

2000 baseline for VOC emissions is 7.7 million tons; the baseline is 11.8 million tons. Beginning in FY 2004, EPA changed the basis for evaluating progress for this measure to reflect actual measured levels of air quality. Previously, EPA had not defined an area as having clean air until the area was formally classified as having met health-based standards. The procedural requirements for classification may require a year or more to complete. The previous total population numbers were for 2000 - 33.4 million (m) 2001 – 382.m; 2002 – 41.7m; 2003 – 47.8m.

Reduce Exposure to Unhealthy PM Levels - PM-10

In 2005 The number of people living in areas with monitored ambient PM concentrations below the NAAQS for the PM-10 standard will increase by 1% (relative to 2004) for a cumulative total of 7% (relative to 1992).

In 2004 The number of people living in areas with monitored ambient PM concentrations below the NAAQS for the PM-10 standard will increase by 1% (relative to 2003) for a cumulative total of 6% (relative to 1992).

In 2003 Maintained healthy air quality for 120 million people living in monitored areas attaining the PM standards; increased by 252 thousand the number of people living in areas with healthy air quality that have newly attained the standard.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Cumulative Percent Increase in the Number of People who Live in Areas with Ambient PM-10 Concentrations Below the Level of the NAAQSas Compared to 1992	Data Lag	6	7	Percent
Cumulative Percent Increase in the Number of Areas with Ambient PM-10 Concentrations Below the Level of the NAAQSas Compared to 1992	Data Lag	40	50	Percent
Total Number of People who Live in Areas Designated in Attainment with Clean Air Standards for PM	120,379,036	120,700,000	122,308,000	People
Areas Designated to Attainment for the PM-10 Standard	5	9	4	Areas
Additional People Living in Newly Designated Areas with Demonstrated Attainment of the PM Standard	252,387	380,000	1,549,648	People
PM-10 Reduced from Mobile Sources	25,000	18,000	62,161	Tons
PM-2.5 Reduced from Mobile Sources	18,000	13,500	61,217	Tons

Baseline: The 1992 baseline for population is the population in areas not classified or designated as attainment for the clean air national ambient air quality standards. The 1992 baseline for areas is those areas that are designated as non-attainment of the NAAQs. Through FY 2003, 120,379,036 are living in areas designated to attainment; 5 areas are designated to attainment for this/these pollutants. The 1995 baseline for PM-10 reduced from mobile sources is 880,000 tons. The 2000 MOBILE 6 inventory is used as the baseline for mobile source emissions as of FY 2005. The 2000 baseline for PM 2.5 from mobile sources is 500,000 tons; the 2000 baseline for PM 2.5 from mobile sources is 613,000 tons. Beginning in FY 2004, EPA changed the basis for evaluating progress fro this measure to reflect actual measured levels of air quality. Previously, EPA had not defined an area as having clean air until the area was formally classified as having met health-based standards. The procedural requirements for classification may require a year or

more to complete. The previous total population numbers were for 2000 – 1.2 million (m) 2001 – 1.2m; 2002 – 3.4m; 2003 – 6.2m.

Reduce Exposure to Unhealthy CO, SO2, NO2, Lead

In 2005 The number of people living in areas with monitored ambient CO, NO2, SO2, or Pb concentrations below the NAAQS will increase by less than 1% (relative to 2004) for a cumulative total of 53% (relative to 1992).

In 2004 The number of people living in areas with monitored ambient CO, NO2, SO2, or Pb concentrations below the NAAQS will increase by 4% (relative to 2003) for a cumulative total of 53% (relative to 1992).

In 2003 Maintained healthy air quality for 53 million people living in monitored areas attaining the CO, SO2, NO2, and Lead standards; increased by .74 million the number of people living in areas with healthy air quality that have newly attained the standard.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Cumulative Percent Increase in the Number of People who Live in Areas with Ambient CO, SO2, NO2, or Pb Concentrations Below the Level of the NAAQS as Compared to 1992		53	53	Percent
Cumulative Percent Increase in the Number of Areas with Ambient CO, SO2, NO2, or Pb Concentrations Below the Level of the NAAQS as Compared to 1992		87	77	Percent
Total Number of People Living in Areas Designated in Attainment with Clean Air Standards for CO, SO2, NO2, and Pb	167,860,905	174,000,000	174,222,000	People
Areas Designated to Attainment for the CO, SO2, NO2, and Pb Standards	5	19	8	Areas
Additional People Living in Newly Designated Areas with Demonstrated Attainment of the CO, SO2, NO2, and Pb Standards	435,309	6,150,000	209,991	People
CO Reduced from Mobile Sources		12,636,000	-841,971	Tons
Total Number of People Living in Areas with Demonstrated Attainment of the NO2 Standard		n/a	n/a	People

Baseline: The 1992 baseline for population is the population in areas not classified or designated as attainment for the clean air national ambient air quality standards. The 1992 baseline for areas is those areas that are designated as non-attainment of the NAAQs. Through FY 2003, 167,860,905 are living in areas designated to attainment; 108 areas are designated to attainment for this/these pollutants. The 1995 baseline for mobile source emissions for CO was 70,947,000 tons. For mobile sources, the 2000 MOBILE 6 inventory is used as the baseline for FY 2005; the 2000 baseline for CO emissions is 79 million tons. While on-road CO emissions continue to decrease, there is an overall increase in mobile source CO emissions due to a growth in nonroad CO. Beginning in FY 2004, EPA changed the basis for evaluating progress fro this measure to reflect actual measured levels of air quality. Previously, EPA had not defined an area as having clean air until the area was formally classified as having met health-based standards. The procedural

requirements for classification may require a year or more to complete. The previous total population numbers were for 2000 – 27.7 million (m) 2001 – 36.3m; 2002 – 36.7m; 2003 – 53.7m.

Reduce Exposure to Unhealthy Ozone Levels - 8 Hour

In 2005 The number of people living in areas with monitored ambient ozone concentrations below the NAAQS for the 8-hour ozone standard will increase by 4% (relative to 2004) for a cumulative total of 7% (relative to 2001).

In 2004 The number of people living in areas with monitored ambient ozone concentrations below the NAAQS for the 8-hour standard will increase by 3% (relative to 2003) for a cumulative total of 3% (relative to 2001).

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Cumulative Percent Increase in the Number of People who Live in Areas with Ambient 8-hour Concentrations Below the Level of the NAAQS as Compared to 2001		<1	<1	Percent
Cumulative Percent Increase in the Number of Areas with Ambient 8-hour Ozone Concentrations Below the Level of the NAAQS as Compared to 2001		<1	<1	Percent

Baseline: EPA will designate the attainment status for areas in April 2004. With that data, we will have the population baseline as well as the number of areas that are not in attainment for the 8-hour ozone standard.

Reduce Exposure to Unhealthy PM Levels - PM- 2.5

In 2005 The number of people living in areas with monitored ambient PM concentrations below the NAAQS for the PM-2.5 standard will increase by 1% (relative to 2003) for a cumulative total of less than 1% (relative to 2001).

In 2004 The number of people living in areas with monitored ambient ozone concentrations below the NAAQS for the PM-2.5 standard will increase by 1% (relative to 2003) for a cumulative total of less than 1% (relative to 2001).

In 2003

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Cumulative Percent Increase in the Number of People who Live in Areas with Ambient PM-2.5 Concentrations Below the Level of the NAAQS as Compared to 2001		1	1	Percent
Percent Increase in the Number of Areas with Ambient PM-2.5 Concentrations Below the Level of the NAAQS as Compared to 2001		1	1	Percent

Baseline: EPA will designate the attainment status for areas in FY 2005. With that data, we will have the population baseline as well as the number of areas that are not in attainment for the PM-2.5 standard.

Increase Tribal Air Capacity

In 2004 Increase the number of tribes monitoring air quality for ozone and/or particulate matter from 42 to 45 and increase the percentage of tribes monitoring clean air for ozone from 64% to 67% and particulate matter from 71% to 72%.

In 2003 39 tribes monitored air quality for ozone and/or particulate matter; 66% of tribes monitored clean air for ozone and 68% monitored for particulate matter.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Percent of Tribes with Tribal Lands Monitoring for Ozone and/or Particulate Matter	39 tribes	13		Percent
Percent of Monitoring Tribes Monitoring Clean Air for Ozone	66	67		Percent
Percent of Monitoring Tribes Monitoring Clean Air for Particulate Matter	68	72		Percent
Number of Tribes Implementing Air Programs		30		Tribes

Baseline: There are 570 Federally recognized Tribes with 341 Tribes having Tribal lands (Alaska Native Villages (Tribes) number 229 entities but only one 'reservation"). During 2003, 39 Tribes conducted monitoring for ozone and/or particulate matter 15 Tribes monitored their airsheds for ozone (10 of which recorded clean air), and 37 Tribes monitored for particulate matter (25 of which recorded clean air). EPA will continue to work with the Tribes to increase the number and/or percentage of Tribes that monitor for clean air.

Acid Rain

In 2005 Reduce total annual average nitrogen deposition and ambient nitrate concentrations 5% from baseline.

In 2005 Reduce total annual average sulfur deposition and ambient sulfate concentrations 27% from baseline.

In 2004 Reduce total annual average nitrogen deposition and mean ambient nitrate concentrations 5% from baseline.

In 2004 Reduce total annual average sulfur deposition and mean ambient sulfate concentrations 25% from baseline.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**
Total Annual Average Sulfur Deposition and Ambient Sulfate concentrations reduced (percent from baseline)		25	27
Total Annual Average Nitrogen Deposition and Ambient Nitrate concentrations reduced (percent from baseline)		5	5

Baseline: Sulfur and nitrogen deposition contribute to acidification of lakes and streams, making them unable to support fish and other aquatic life. Reductions in both total sulfur and nitrogen deposition is critical to reducing the number of chronically acidic water bodies. Ambient sulfate and ambient nitrate ("acid rain particulate") contributes to unhealthy air and respiratory problems in humans, especially children and other sensitive populations. The baseline is established from

monitored site levels based on consolidated map of 1989-1991 showing a three year of deposition levels produced from the CASTNet site (http://www.epa.gov/airmarkets/castnet/sites.html).

VERIFICATION AND VALIDATION OF PERFORMACE MEASURES

FY 2005 Performance Measure:

- **Combined Stationary and Mobile Source Reductions in Air Toxics Emissions**
- **Mobile Source Air Toxics Emissions Reduced**
- **Stationary Source Air Toxics Emissions Reduced**
- **All Other Air Toxics Emissions Reduced**

Performance Database: National Emissions Inventory (NEI) for Hazardous Air Pollutants (HAPs)

Data Source: The NEI for HAPs includes emissions from large and small industrial sources inventoried as point sources, smaller stationary area and other sources, such as fires inventoried as non-point sources, and mobile sources.

Prior to 1999 NEI for HAPs, there was the National Toxics Inventory (NTI). The baseline NTI (for base years 1990 - 1993) includes emissions information for 188 hazardous air pollutants from more than 900 stationary sources and from mobile sources. It is based on data collected during the development of Maximum Achievable Control Technology (MACT) standards, state and local data, Toxics Release Inventory (TRI) data, and emissions estimates using accepted emission inventory methodologies. The baseline NTI contains county level emissions data and cannot be used for modeling because it does not contain facility specific data.

The 1996 NTI and the 1999 NEI for HAPs contain stationary and mobile source estimates that are used as input to National Air Toxics Assessment (NATA) modeling. The 1996 NTI and 1999 NEI for HAPs contain estimates of facility-specific HAP emissions and their source specific parameters necessary for modeling such as location (latitude and longitude) and facility characteristics (stack height, exit velocity, temperature, etc.)

The primary sources of data in the 1996 and 1999 NTI are state and local air pollution control agencies and Tribes. These data vary in completeness, format, and quality. EPA evaluates these data and supplements them with data gathered while developing MACT and residual risk standards, industry data, and TRI data. To produce a complete model-ready national inventory, EPA estimates emissions for approximately 30 non-point source categories such as wildfires and residential heating sources not included in the state, local and Tribal data. Mobile source data are developed using data provided by state and local agencies and Tribes and the most current onroad and nonroad models developed by EPA's Office of Transportation and Air Quality. The draft 1996 NTI and 1999 NEI for HAPS underwent extensive review by state and local agencies, Tribes, industry, EPA, and the public.

For more information and references on the development of the 1996 NTI, please go to the following web site: www.epa.gov/ttn/chief/nti/index.html#nti. For more information and

references on the development of the 1999 NEI for HAPs, please go to the following web site: www.epa.gov/ttn/chief/net/index.html#1999

Methods, Assumptions and Suitability: The EMS-HAP (Emissions Modeling System for Hazardous Air Pollutants) is used to estimate annual emissions of air toxics for the 1996 NTI and 1999 NEI for HAPS (and for all years in-between). EMS-HAP is an emissions processor that performs the steps needed to process an emission inventory for input into the NATA model. These steps include: spatial allocation of nonpoint stationary area and mobile source emissions from the county level to the census tract level, and temporal allocation of annual emission rates to annually averaged (i.e., same rate for every day of the year) 3-hour emission rates. In addition, EMS-HAP can project future emissions, by adjusting stationary source emission data to account for growth and emission reductions resulting from emission reduction scenarios such as the implementation of the Maximum Achievable Control Technology (MACT) standards.

For more information and references on EMS-HAP, please go to the following web sites:
http://www.epa.gov/scram001/tt22.htm#aspen and
http://www.epa.gov/ttn/chief/emch/projection/emshap.html.
The growth and reduction information used for the projections are further described on the following website: http://www.epa.gov/ttn/chief/emch/projection/emshap.html

QA/QC Procedures: The NTI and the NEI for HAPs are databases designed to house information from other primary sources. The EPA performs extensive quality assurance/quality control (QA/QC) activities, including checking data provided by other organizations, to improve the quality of the emission inventory. Some of these activities include: (1) the use of an automated format QC tool to identify potential errors of data integrity, code values, and range checks; (2) use of geographical information system (GIS) tools to verify facility locations; and (3) automated content analysis by pollutant, source category and facility to identify potential problems with emission estimates such as outliers, duplicate sites, duplicate emissions, coverage of a source category, etc. The content analysis includes a variety of comparative and statistical analyses. The comparative analyses help reviewers prioritize which source categories and pollutants to review in more detail based on comparisons using current inventory data and prior inventories. The statistical analyses help reviewers identify potential outliers by providing the minimum, maximum, average, standard deviation, and selected percentile values based on current data. The EPA is currently developing an automated QC content tool for data providers to use prior to submitting their data to EPA. After investigating errors identified using the automated QC format and GIS tools, the EPA follows specific guidance on augmenting data for missing data fields. This guidance is available at the following web site: http://www.epa.gov/ttn/chief/emch/invent/qaaugmementationmemo_99nei_60603.pdf

The NTI database contains data fields that indicate if a field has been augmented and identifies the augmentation method. After performing the content analysis, the EPA contacts data providers to reconcile potential errors. The draft NTI is posted for external review and includes a README file, with instructions on review of data and submission of revisions, state-by-state modeling files with all modeled data fields, and summary files to assist in the review of the data. One of the summary files includes a comparison of point source data submitted by different organizations. During the external review of the data, state and local agencies, Tribes, and industry provide external QA of the inventory. The EPA evaluates proposed revisions from external reviewers and prepares memos for individual reviewers documenting incorporation of

revisions and explanations if revisions were not incorporated. All revisions are tracked in the database with the source of original data and sources of subsequent revision.

The external QA and the internal QC of the inventory have resulted in significant changes in the initial emission estimates, as seen by comparison of the initial draft NEI for HAPs and its final version. For more information on QA/QC of the NEI for HAPs, please refer to the following web site for a paper presented at the 2002 Emission Inventory Conference in Atlanta. "QA/QC - An Integral Step in the Development of the 1999 National Emission Inventory for HAPs", Anne Pope, et al. www.epa.gov/ttn/chief/conference/ei11/qa/pope.pdf

EPA's Office of Environmental Information (OEI) has created uniform data standards or elements, which provide "meta" information on the standard NEI Input Format (NIF) fields. These standards were developed by teams representing states, Tribes, EPA and other Federal agencies. The use of common data standards among partners fosters consistently defined and formatted data elements and sets of data values, and provides public access to more meaningful data. The standards relevant to the NEI for HAPs are the: SIC/NAICS, Latitude/Longitude, Chemical Identification, Facility Identification, Date, Tribal and Contact Data Standards. The 1999 NEI for HAPs is compliant with all new data standards except the Facility Identification Standard because OEI has not completed its assignment of Facility IDs to the 1999 NEI for HAPs facilities.

For more information on compliance of the NEI for HAPs with new OMB Information Quality Guidelines and new EPA data standards, please refer to the following web site for a paper presented at the 2003 Emission Inventory Conference in San Diego. "The Challenge of Meeting New EPA Data Standards and Information Quality Guidelines in the Development of the 2002 NEI Point Source Data for HAPs", Anne Pope, et al.
www.epa.gov/ttn/chief/conference/ei12/dm/pope.pdf

The 2002 NEI for HAPs will undergo scientific peer review.

Data Quality Review: EPA staff, state and local agencies, Tribes, industry and the public review the NTI and the NEI for HAPs. To assist in the review of the 1999 NEI for HAPs, the EPA provided a comparison of data from the three data sources (MACT/residual risk data, TRI, and state, local and Tribal inventories) for each facility. For the 1999 NEI for HAPs, two periods were available for external review - October 2001 - February 2002 and October 2002 - March 2003.

Both the full draft 1996 National Air Toxics Assessment and several of the individual components of the assessment have been subjected to the scrutiny of leading scientists throughout the country in a process called "scientific peer review." This ensures that EPA uses the best available scientific methods and information. In 2001, EPA's Science Advisory Board (SAB) reviewed the 1996 national-scale assessment. The review was generally supportive of the assessment purpose, methods, and presentation; the committee considers this an important step toward a better understanding of air toxics. Many of the SAB comments related to possible improvements for future assessments (additional national-scale assessments are being planned for the base year 1999 and for every 3 years thereafter) and raised technical issues that would merit further investigation. EPA will follow up on these issues. Additional information is available on the Internet: www.epa.gov/ttn/atw/nata/peer.html.

The following describes the various scientific peer review activities that are associated with the 1996 national air toxics assessment:

- EPA's Science Advisory Board peer-reviewed the ASPEN dispersion model used in the Cumulative Exposure Project (CEP). The Science Advisory Board issued their report in 1996. It can be found at http://www.epa.gov/sab/fiscal96.htm.

- The HAPEM exposure model underwent a peer review by EPA scientists and an external peer review in the summer of 2000. While the peer review identified several limitations inherent in the current methodology, it is still acknowledged as an appropriate tool to help better understand the relation of human exposures to ambient concentration levels.

Data Limitations: The NTI and the NEI for HAPs contain data from other primary references. Because of the different data sources, not all information in the NTI and the NEI for HAPs has been developed using identical methods. Also, for the same reason, there are likely some geographic areas with more detail and accuracy than others. Because of the lesser level of detail in the 1993 NTI, it is not suitable for input to dispersion models.

For a discussion of the data limitations in the 1999 NEI for HAPs, please refer to the discussion of Information Quality Guidelines in the documentation at:
www.epa.gov/ttn/chief/net/index.html#haps99 .

New/Improved Data or Systems: The 1996 NTI and 1999 NEI for HAPs are a significant improvement over the baseline 1993 NTI because of the added facility-level detail (e.g., stack heights, latitude/longitude locations), making it more useful for dispersion model input. Future inventories (2002 and later years) are expected to improve significantly because of increased interest in the NEI for HAPs by regulatory agencies, environmental interests, and industry, and the greater potential for modeling and trend analysis. During the development of the 1999 NEI for HAPs, all primary data submitters and reviewers were required to submit their data and revisions to EPA in a standardized format using the Agency's Central Data Exchange (CDX). For more information on CDX, please go the following web site: www.epa.gov/ttn/chief/nif/cdx.html

References: The NTI and NEI data and documentation are available at the following sites:

ftp site:	ftp://ftp.epa.gov/EmisInventory/
Available inventories:	1996 NTI, 1999 NEI for HAPs
Contents:	Modeling data files for each state
	Summary data files for nation
	Documentation
	README file
Audience:	individuals who want full access to NTI files
NEON:	http://ttnwww.rtpnc.epa.gov/Neon/
Available inventories:	1996 NTI and 1999 NEI for HAPs
Contents:	Summary data files
Audience:	EPA staff

CHIEF:	www.epa.gov/ttn/chief 1999 NEI for HAPs data development materials 1999 Data Incorporation Plan - describes how EPA compiled the 1999 NEI for HAPs QC tool for data submitters Data Augmentation Memo describes procedures EPA will use to augment data 99 NTI Q's and A's provides answers to frequently asked questions NIF (Input Format) files and descriptions CDX Data Submittal Procedures - instructions on how to submit data using CDX Training materials on development of HAP emission inventories Emission factor documents, databases, and models
Audience:	State and local agencies, Tribes, industry, EPA, and the public

FY 2005 Performance Measures:

- **SO_2 emissions reduced (tons/year from baseline)**
- **Total annual average sulfur deposition and mean ambient sulfate concentrations reduced (% from baseline)**
- **Total annual average nitrogen deposition and mean ambient nitrate concentrations reduced (% from baseline)**

Performance Databases:

- Emissions Tracking System (ETS) - SO_2 and NO_X emissions collected by Continuous Emission Monitoring Systems (CEMS) or equivalent continuous monitoring methods.
- Clean Air Status and Trends Network (CASTNet) - dry acid deposition; weekly average ambient concentrations of sulfate, nitrate, sulfur dioxide, nitric acid, ammonium; meteorological data required for calculating deposition rates.
- National Atmospheric Deposition Program (NADP) - wet acid (sulfur and nitrogen) deposition.

Data Sources: On a quarterly basis, ETS receives and processes hourly measurements of SO_2, NO_x, volumetric flow, CO_2, and other emission-related parameters from more than 2,500 fossil fuel-fired utility units affected under the Title IV Acid Rain Program. For the 5-month ozone season (May 1 - September 30), ETS receives and processes hourly NO_x measurements from electric generation units (EGUs) and certain large industrial combustion units affected by NO_x Budget Programs under the NO_x State Implementation Plan (SIP) Call. In 2004, the initial compliance year for the NO_x SIP Call, up to 2000 units in as many as 20 states and D.C. will be reporting seasonal NO_x data to ETS. Over 900 units have been reporting these data since 1999 under the OTC NO_x Budget Program.

CASTNet measures particle and gas acidic deposition chemistry. Specifically, CASTNet measures sulfate and nitrate dry deposition and meteorological information at approximately 70 monitoring sites, primarily in the East. CASTNet is a long-term dry deposition network funded, operated and maintained by EPA's Office of Air and Radiation (OAR).

NADP is a national long-term wet deposition network that measures precipitation chemistry and provides long-term geographic and temporal trends in concentration and deposition of precipitation components. Specifically, NADP provides measurements of sulfate and nitrate wet deposition at approximately 230 monitoring sites. EPA, along with several other Federal agencies, states, and other private organizations, provide funding and support for NADP. The Illinois State Water Survey/University of Illinois maintains the NADP database.

The deposition monitoring networks have been in operation for over 25 years. They provide invaluable measurements on long-term trends and episodes in acid deposition; such data are essential for assessing progress toward the program's intended environmental and welfare outcomes. These networks are aging and need to be modernized to ensure the continued availability of these direct environmental measures. Much of the equipment is beyond its useful life, replacement parts are difficult to procure, and the data processing is outmoded and expensive. To date, modernization of this network has not been considered a priority. Unless this situation changes, the Agency's ability to assess long-term performance measures will be compromised.

Methods, Assumption, and Suitability: Consistent, well-defined methods for data aggregation and monitor tests have been incorporated into program regulations (40 CFR Part 75 (Continuous Emissions Monitoring). Original final rule issued 58 FR 3701-3757 (Jan 11, 1993). Rule revisions to improve program issued 60 FR 26510 (May 17, 1995), 61 FR 59142 (Nov 20, 1996), 63 FR 57356, 573581 and 57499 (Oct 27, 1998), 64 FR 28564 (May 26, 1999), and 67 FR 40394 (June 12, 2002)).that were promulgated in notice and comment (public) rulemakings. These methods are used to aggregate data across all affected utilities for each pollutant and related source operating parameters. They specify how to calculate the baseline and test for quality assurance.

QA/QC Procedures: QA/QC requirements in the program regulations require that a series of quality assurance tests are performed at least annually to assure valid CEMS performance. For these tests, emissions data are collected under highly structured, carefully designed testing conditions, which involve either high quality standard reference materials or multiple instruments performing simultaneous emission measurements. The resulting data are screened and analyzed using a battery of statistical procedures, including one that tests for systematic bias. If a CEM fails the bias test, indicating a potential for systematic underestimation of emissions, the source of the error must be identified and corrected or the data are adjusted to compensate for the measurement bias. Further information available on the Internet: http://www.epa.gov/airmarkets/reporting/index.html

CASTNet established a Quality Assurance Project Plan (QAPP) in November 2001; The QAPP contains data quality objectives and quality control procedures for accuracy and precision. {U.S. EPA, Office of Air Quality Planning and Standards, *Clean Air Status and Trends Network (CASTNet) Quality Assurance Project Plan* (Research Triangle Park, NC: U.S. EPA, November 2001). Available at http://www.epa.gov/castnet/library/qapp.html.

NADP has established data quality objectives and quality control procedures for accuracy, precision and representation, available on the Internet: http://nadp.sws.uiuc.edu/QA/. The intended use of these data is to establish spatial and temporal trends in wet deposition and precipitation chemistry.

Data Quality Review: The ETS provides instant feedback to sources on data reporting problems, format errors, and inconsistencies. The electronic data file QA checks are described at http://www.epa.gov/airmarkets/reporting/index.html (see *Electronic Data Report Review Process*, *ETS Tolerance Tables*, *Active ETS Error Codes/Messages* and *Range Format Errors*). All quarterly reports are analyzed to detect deficiencies and to identify reports that must be resubmitted to correct problems. EPA also identifies reports that were not submitted by the appropriate reporting deadline. Revised quarterly reports, with corrected deficiencies found during the data review process, must be obtained from sources by a specified deadline. All data are reviewed, and preliminary and final emissions data reports are prepared for public release and compliance determination.

CASTNet underwent formal peer review in 1997 by a panel of scientists from EPA and the National Oceanographic Atmospheric Administration (NOAA). Findings are documented in *Examination of CASTNet: Data, Results, Costs, and Implications* (United States EPA, Office of Research and Development, National Exposure Research Laboratory, February 1997).

The NADP methods of determining wet deposition values have undergone extensive peer review, handled entirely by the NADP housed at the Illinois State Water Survey/University of Illinois. Assessments of changes in NADP methods are developed primarily through the academic community and reviewed through the technical literature process.

Data Limitations: In order to improve the spatial resolution of CASTNet, additional monitoring sites are needed. CASTNet has no geographic coverage for the middle of the country and very limited coverage in the Northwest.

Error Estimate: None

New/Improved Data or Systems: EPA is investigating ways to modernize aging CASTNet equipment; streamline site operation, data collection and processing methods; reduce system operating costs; and provide a foundation for mutipollutant measurement compatible with other networks.

References: For additional information about CASTNet, see http://www.epa.gov/castnet/ and for NADP, see http://nadp.sws.uiuc.edu/. For a description of EPA's Acid Rain program, see http://www.epa.gov/airmarkets/arp/index.html/ and in the electronic Code of Federal Regulations at http://www.epa.gov/docs/epacfr40/chapt-I.info/subch-C.htm (40 CFR parts 72-78.)

FY 2005 Performance Measures:

- **Cumulative percent increase in the number of people who live in areas with ambient criteria pollutant concentrations below the level of the NAAQS.**

- **Cumulative percent increase in the number of areas with ambient criteria pollutant concentrations below the level of the NAAQS.**
- **Areas designated to attainment for the NAAQS.**

Performance Databases:
AQS —The Air Quality Subsystem (AQS) stores ambient air quality data used to evaluate an area's air quality levels relative to the NAAQS.

FREDS—The Findings and Required Elements Data System is used to track progress of states and Regions in reviewing and approving the required data elements of the State Implementation Plans (SIP). SIPs are clean air plans and define what actions a state will take to improve the air quality in areas that do not meet national ambient air quality standards

Data Sources:
AQS: State & local agency data from State and Local Air Monitoring Stations (SLAMS).

Population: Data from Census-Bureau/Department of Commerce

FREDS: Data are provided by EPA's Regional offices.

Methods, Assumptions, and Suitability: Air quality levels are evaluated relative to the level of the appropriate NAAQS. Next the populations in areas with air quality concentrations above the level of the NAAQS are aggregated. This analysis assumes that the populations of the areas are held constant at 2000 Census levels. Data comparisons over several years allow assessment of the air program's success.

QA/QC Procedures: AQS: The QA/QC of the national air monitoring program has several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, EPA's National Performance Audit Program (NPAP), system audits, and network reviews (Available on the Internet: www.epa.gov/ttn/amtic/npaplist.html) To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and site criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent requirements; 4) acceptable data validation and record keeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections. Further information available on the Internet: http://www.epa.gov/cludygxb/programs/namslam.html and through United States EPA's Quality Assurance Handbook (EPA-454/R-98-004 Section 15)

Populations: No additional QA/QC beyond that done by the Census Bureau/Department of Commerce.

FREDS: No formal QA/QC procedures.

Data Quality Review:
AQS: No external audits have been done in the last 3 years. However, internal audits are regularly conducted.

Populations: No additional QA/QC beyond that done by the Census Bureau/Department of Commerce.

FREDS: None

Data Limitations:
AQS: None known

Populations: No additional QA/QC beyond that done by the Census Bureau/Department of Commerce.

FREDS: None known

Error Estimate: At this time it is not possible to develop an error estimate. Uncertainty in projections (from modeling) and near term variations in air quality (due to meteorological conditions for example) exist.

New/Improved Data or Systems:
AQS: In January 2002, EPA completed the reengineering of AQS to make it a more user friendly, Windows-based system. As a result, air quality data will be more easily accessible via the Internet. AQS has also been enhanced to comply with the Agency's data standards (*e.g.,* latitude/longitude, chemical nomenclature). Beginning in July 2003, agencies submitted air quality data to AQS thru the Agency's Central Data Exchange (CDX). CDX is intended to be the portal through which all environmental data coming to or leaving the Agency will pass.

Population: None

FREDS: None

References: For additional information about criteria pollutant data, non-attainment areas, and other related information, see: http://www.epa.gov/airtrends/.

FY 2005 Performance Measures:

- **Estimated Mobile Source VOC Emissions**
- **Estimated Mobile Source NOx Emissions**
- **Estimated Mobile Source PM 10 Emissions**
- **Estimated Mobile Source PM 2.5 Emissions**
- **Estimated Mobile Source CO Emissions**

Performance Database: National Emissions Inventory Database. See: http://www.epa.gov/ttn/chief/trends/

Data Source: Mobile source emissions inventories. Estimates for on-road, off-road mobile source emissions are built from inventories fed into the relevant models, which in turn provide input to the National Emissions Inventory Database.

The MOBILE vehicle emission factor model is a software tool for predicting gram per mile emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, carbon dioxide, particulate matter, and toxics from cars, trucks, and motorcycles under various conditions.

The NONROAD emission inventory model is a software tool for predicting emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, particulate matter, and sulfur dioxides from small and large off road vehicles, equipment, and engines.
Certain mobile source information is updated annually. Inputs are updated annually only if there is a rationale and readily available source of annual data. Generally, Vehicle Miles Traveled (VMT), the mix of VMT by type of vehicle (Federal Highway Administration (FHWA)-types), temperature, gasoline properties, and the designs of Inspection/Maintenance (I/M) programs are updated each year. Emission factors for all mobile sources and activity estimates for non-road sources are changed only when the Office of Transportation and Air Quality requests that this be done and is able to provide the new information in a timely manner. The most recent models for mobile sources are Mobile 6 and Nonroad 2002. (Available on the Internet at http://www.epa.gov/otaq/models.htm.)

Methods, Assumptions, and Suitability: EPA issues emissions standards that set limits on how much pollution can be emitted from a given mobile source. Mobile sources include vehicles that operate on roads and highways ("on road" or "highway" vehicles), as well as nonroad vehicles, engines, and equipment. Examples of mobile sources are cars, trucks, buses, earthmoving equipment, lawn and garden power tools, ships, railroad locomotives, and airplanes. Vehicle and equipment manufacturers have responded to many mobile source emission standards by redesigning vehicles and engines to reduce pollution.

EPA uses models to estimate mobile source emissions, for both past and future years. The estimates are used in a variety of different settings, like rulemaking.

The most complete and systematic process for making and recording such mobile source emissions estimates is the “Trends” inventory process executed each year by the Office of Air Quality Planning and Standards’ (OAQPS) Emissions, Monitoring, and Analysis Division (EMAD). The Assessment and Modeling Division, within the Office of Transportation and Air Quality, provides EMAD information and methods for making the mobile source estimates. In addition, EMAD’s contractors obtain necessary information directly from other sources; for example, weather data and the Federal Highway Administration’s (FHWA) Vehicle Miles Traveled (VMT) estimates by state. EMAD creates and publishes the emission inventory estimate for the most recent historical year, detailed down to the county level and with over 30 line items representing mobile sources. At irregular intervals as required for regulatory analysis projects, EMAD creates estimates of emissions for future years. When the method for estimating emissions changes significantly, EMAD usually revises its older estimates of emissions in years prior to the most recent year, to avoid a sudden discontinuity in the apparent emissions trend. EMAD publishes the national emission estimates in hardcopy; county-level estimates are available electronically. Additional information about transportation and air quality related to estimating, testing for, and measuring emissions, as well as research being conducted on technologies for reducing emissions is available at http://www.epa.gov/otaq/research.htm

QA/QC Procedures: The emissions inventories are continuously improved.

Data Quality Review: The emissions inventories are reviewed by both internal and external parties.

Data Limitations: The limitations of the inventory estimates for mobile sources come from limitations in the modeled emission factors (based on emission factor testing and models predicting overall fleet emission factors in g/mile) and also in the estimated vehicle miles traveled for each vehicle class (derived from Department of Transportation data).http://www.epa.gov/otaq/m6.htm. For nonroad emissions, the estimates come from a model using equipment populations, emission factors per hour or unit of work, and an estimate of usage. This nonroad emissions model accounts for over 200 types of nonroad equipment. Any limitations in the input data will carry over into limitations in the emission inventory estimates.

Error Estimate: Additional information about data integrity is available on the Internet: http://www.epa.gov/otaq/m6.htm.

New/Improved Data or Systems: To keep pace with new analysis needs, new modeling approaches, and new data, EPA is currently working on a new modeling system termed the Multi-scale Motor Vehicles and Equipment Emission System (MOVES). This new system will estimate emissions for on road and off road sources, cover a broad range of pollutants, and allow multiple scale analysis, from fine scale analysis to national inventory estimation. When fully implemented, MOVES will serve as the replacement for MOBILE6 and NONROAD. The new system will not necessarily be a single piece of software, but instead will encompass the necessary tools, algorithms, underlying data and guidance necessary for use in all official analyses associated with regulatory development, compliance with statutory requirements, and national/regional inventory projections. Additional information is available on the Internet: http://www.epa.gov/otaq/ngm.htm

References: For additional information about mobile source programs see: http://www.epa.gov/otaq/.

EFFICIENCY MEASURES/MEASUREMENT DEVELOPMENT PLANS

EPA continues to place a great emphasis on improving its set of performance measures. In addition to and complementing the Agency's outcome-based environmental performance measures, some programs are developing efficiency measures. Efficiency measures are structured as a ratio of key program inputs (e.g. time, dollars, FTE) to program outputs or outcomes. They are intended to provide EPA programs with additional information that can be used for sound decision-making and program management.

Below are EPA's proposed efficiency measures for selected programs.

Acid Rain

EPA is in the process of developing efficiency measures to evaluate progress in reducing transaction costs for Acid Rain and related market-based programs. These transactions cost efficiencies deal with e-Gov practices and minimizing emissions data reporting transaction costs. For example, the Agency plans by 2005 to reduce annual emissions and monitor certification data reporting costs by 50% from approximately $4,000 per unit in the baseline year of 2000.

Air Toxics

EPA is working to improve long-term measures to better understand the risks from air toxics. Currently we measure the tons of toxics reduced as a result of our programs. To better understand the risks we are reducing, we are exploring the potential to develop measures/efficiency measures**,** indicators, including:

- Toxicity-weighted emissions: Using our National Emissions Inventory, we would estimate the tons of emissions reduced and then weight each air toxic by health criteria, such as the Unit Risk Estimate. With this weighted inventory, we would have a relative risk ranking of the reductions, providing some indication of the degree to which we are reducing the most harmful toxics.

- Reductions in ambient levels of toxics: We are developing a national air toxics monitoring network and will use these sites as well as certain existing state monitoring sites to track reductions in ambient levels of toxics over time. These sites cover a defined set of air toxics and will provide useful trend information over the longer-term.

- Reductions in risks across the population: As part of the National Air Toxics Assessment (NATA) that we update every three years, we can evaluate the cumulative risk levels for the general population from 32 air toxics and measure changes in these risk levels over time (e.g., number of people below one in a million cancer risk). Currently NATA considers only inhalation risks.

- Local-scale risk reductions: We have several local-scale modeling and monitoring efforts underway. Through these assessments we can track changes in risk levels over time for specific geographic areas. Unlike the other tools that we've developed at this point, these local-scale analyses may be able to consider multiple pathways of exposure, not just inhalation.

Measure development is referenced in the Program Assessment Rating Tool (PART) summary in the Special Analysis section.

Mobile Source Standards and Certification

The Motor Vehicle and Engine Compliance Program (MVECP) is responsible for the certification and compliance of light-duty vehicles and trucks, heavy-duty highway vehicles and engines, highway motorcycles, and certain non-road vehicles and engines.

A certificate of conformity is generally required when a manufacturer decides to market new vehicles or engines in the United States. Before issuing that certificate, EPA must perform certain activities necessary to ensure compliance with regulations implemented within the MVECP.

A possible efficiency measure could be the costs per certificate issued within each class of vehicles and engines covered by the MVECP (e.g., light duty vehicles and trucks; non-road CI engines; heavy-duty highway engines; etc.).

School Bus Retrofits

In FY 2005 EPA will collect and assess data from the FY 2003 and earlier school bus demonstration projects to develop projections that relate funding levels to specific program measures. This assessment will allow us to develop specific, outcome-oriented measures such as the overall number of buses that will be retrofitted each year, along with the associated emission benefits.

COORDINATION WITH OTHER AGENCIES

EPA cooperates with other Federal, state, Tribal, and local agencies in achieving goals related to ground level ozone and PM. EPA continues to work closely with the Department of Agriculture and the Forest Service in developing its burning policy and reviewing practices that can reduce emissions. EPA, the Department of Transportation (DOT), and the Army Corps of Engineers work with state and local agencies to integrate transportation and air quality plans, reduce traffic congestion, and promote livable communities. EPA continues to work with the Department of the Interior, National Park Service, in developing its regional haze program and deploying the IMPROVE visibility monitoring network. The operation and analysis of data produced by the PM monitoring system is an example of the close coordination of effort between the EPA and state and Tribal governments.

For pollution assessments and transport, EPA is working with the National Aeronautics and Space Administration (NASA) on technology transfer using satellite imagery. In FY 2005, EPA will be working to further distribute NASA satellite products to Regions, states, local agencies, and Tribes to assist with PM forecasting and to provide better understanding of air quality on a day-to-day basis. EPA will also work with NASA in FY 2005 to develop a better understanding of PM formation using satellite data. EPA works with the Department of the Army, Department of Defense on advancing emission measurement technology and with the National Oceanic and Atmospheric Administration (NOAA), Department of Commerce for meteorological support for our modeling and monitoring efforts.

To better understand the magnitude, sources, and causes of mobile source pollution, EPA works with the Department of Energy (DOE) and DOT to fund research projects. The DOT's mobile source projects include TRANSIMS (TRansportation ANalysis and SIMulation System) and other transportation modeling projects; DOE is funding these projects through the National Renewable Energy Laboratory. EPA also works closely with DOE on refinery cost modeling analyses for EPA's clean fuel programs. For mobile sources program outreach, the Agency is participating in a collaborative effort with DOT's Federal Highway Administration and the

Federal Transit Administration designed to educate the public about the impacts of transportation choices on traffic congestion, air quality, and human health. This community-based public education initiative also includes the Centers for Disease Control. In addition, EPA is working with DOE to identify opportunities in the Clean Cities program. EPA will also be working with other Federal agencies such as the U.S. Coast Guard on air emission issues. EPA works with the Department of Energy (DOE) on several fuels programs. Other programs targeted to reduce air toxics from mobile sources are coordinated with the Department of Transportation (DOT). These partnerships can involve policy assessments and toxic emission reduction strategies in different regions of the country.

To develop new continuous source monitoring technology for toxic metals emitted from smokestacks, EPA has partnered with the Department of Defense (DOD). This partnership will provide a new source monitoring tool that will streamline source monitoring requirements that a number of DOD incinerators are required to meet and improve the operation of DOD incinerators with real-time emissions information resulting in reduced releases of air toxics to the environment. In time, this technology is expected to be available for use at non-DOD facilities.

For the clean fuel programs, EPA works closely with the DOE on refinery cost modeling analyses. For mobile sources program outreach, the Agency is participating in a collaborative effort with DOT's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) designed to educate the public about the impacts of transportation choices on traffic congestion, air quality, and public health. This community-based public education initiative also includes the Centers for Disease Control (CDC). In addition, EPA works with DOE to identify opportunities in the Clean Cities program. EPA also works cooperatively with DOE to better characterize gasoline PM emissions and characterize the contribution of gasoline vehicles and engine emissions to ambient PM levels.

To reduce air toxic emissions do not inadvertently increase worker exposures, EPA is continuing to work closely with the Department of Labor’s Occupational Safety and Health Administration (OSHA) to coordinate the development of EPA and OSHA standards. EPA also works closely with other health agencies such as the CDC, the National Institute of Environmental Health Sciences (NIEHS), and the National Institute for Occupational Safety and Health on health risk characterization. To assess atmospheric deposition and characterize ecological effects, EPA works with the Department of Commerce’s National Oceanic and Atmospheric Administration and the Department of the Interior’s U.S. Fish and Wildlife Service.

The Agency has worked extensively with the Department of Health and Human Services (HHS) on the National Health and Nutritional Evaluation Study to identify mercury accumulations in humans. EPA also has worked with DOE on the ‘Fate of Mercury’ study to characterize mercury transport and traceability in Lake Superior.

To determine the extent to which agricultural activities contribute to air pollution, EPA will continue to work closely with the USDA through the joint USDA/EPA AAQTF. The AAQTF is a workgroup set up by Congress to oversee agricultural air quality-related issues and to develop cost-effective ways in which the agricultural community can improve air quality. In addition, the AAQTF coordinates research on agricultural air quality issues to avoid duplication and ensure data quality and sound interpretation of data.

In developing regional and international air quality programs and projects, EPA works primarily with the Department of State, the Agency for International Development, and the Department of Energy as well as with regional organizations. EPA's international air quality management program will complement EPA's programs on children's health, Trade and the Environment, and trans-boundary air pollution. In addition, EPA will partner with others worldwide, including international organizations such as the United Nations Environment Programme, the European Union, the OECD, the World Bank, the Asian Development Bank, and our colleagues in Canada, Mexico, Europe, and Japan.

STATUTORY AUTHORITIES

Alternative Motor Fuels Act of 1988
Clean Air Act (42 U.S.C. 7401-7671g)
Motor Vehicle Information and Cost Savings Act
National Environmental Policy Act (NEPA)
National Highway System Designation Act

OBJECTIVE: Healthier Indoor Air

By 2008, 22.6 million more Americans than in 1994 will be experiencing healthier indoor air in homes, schools, and office buildings.

Resource Summary
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Healthier Indoor Air	**$44,299.1**	**$48,042.5**	**$48,954.7**	**$912.1**
Environmental Program & Management	$32,649.2	$37,916.4	$38,695.1	$778.6
Science & Technology	$1,611.8	$1,289.0	$1,367.3	$78.3
State and Tribal Assistance Grants	$9,415.3	$8,150	$8,150	$0
Buildings & Facilities	$417.0	$414.6	$465.0	$50.4
Inspector General	$205.8	$272.5	$277.3	$4.8
Total Workyears	152.0	149.9	153.2	3.4

Program Project
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Categorical Grant: Radon	$9,415.3	$8,150.0	$8,150.0	$0.0
Indoor Air: Asthma Program	$9,062.6	$11,097.0	$11,197.3	$100.3
Indoor Air: Environment Tobacco Smoke Program	$2,832.8	$3,617.5	$3,695.1	$77.6
Indoor Air: Radon Program	$5,843.6	$5,871.1	$6,065.6	$194.5
Indoor Air: Schools and Workplace Program	$9,005.2	$11,176.2	$11,258.2	$82.0
Administrative Projects	$8,139.6	$8,130.7	$8,588.5	$457.7
TOTAL	**$44,299.1**	**$48,042.5**	**$48,954.7**	**$912.1**

FY 2005 REQUEST

Health effects of indoor air pollution. Research conducted by the Environmental Protection Agency (EPA) and others, beginning in the late 1970's, indicates that Americans spend about 90 percent of their time indoors, where they are exposed to levels of pollutants that are often higher than those outdoors.[45] Indoor air pollution can pose high risks to human health, especially to sensitive populations. Estimates of the economic costs to the nation of poor indoor air quality, including lost worker productivity, direct medical costs for those whose health is adversely affected, and damage to equipment and materials, are on the order of tens of billions of dollars per year.[46] In 2000, the National Academy of Sciences (NAS) affirmed the significance of indoor triggers of asthma and the alarming increase in asthma rates nationwide.[47]

Indoor air pollutants continue to have significant impacts in our homes, schools, and workplaces:

- An estimated 20 million people in the United States have asthma.[48] The number of children with asthma has more than doubled since 1980. In 2001, an estimated 6.3 million children had asthma, of which nearly one in 13 are school-aged. Each year over 14 million school days are missed by children with asthma. There also continues to be significant racial and ethnic disparities in asthma morbidity and mortality in the United States; African-Americans continue to have higher rates of asthma emergency room visits, hospitalizations, and deaths than Caucasians.[49]

- In 2000, there were 214,000 hospitalizations and more than 1.8 million emergency room visits.[50] Asthma's estimated annual cost to the Nation is $14.0 billion.[51]

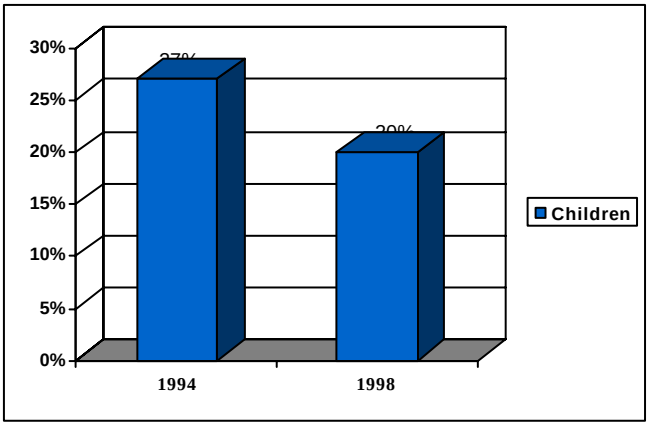
- There is substantial evidence that indoor exposures to secondhand smoke (ShS, also known as environmental tobacco smoke or ETS) and indoor allergens from dust mites, pests, molds, and pets play a significant role in triggering asthma episodes, and, in some instances (ShS and dust mites), are causally linked to the development of the disease. Indeed, estimates suggest that approximately 80% of asthma in children (or 5 million children) is allergic asthma.[52]

- As of 1998, young children were exposed to ShS in approximately 20.3 percent of U.S. homes, increasing their risk for asthma and causing thousands of lung infections and other

[45] Report to Congress on Indoor Air Quality, EPA/400/1-89-001.
[46] Mendell et al., *Improving the Health of Workers in Indoor Environments*, Am. J. Pub. Health, 92, 1430 2002.
[47] Clearing the Air: Asthma and Indoor Air Exposures. ISBN 0-309-06496-1. January 2000.
[48] American Lung Association. "Trends in Asthma Morbidity and Mortality." ALA: New York, NY. March 2003.
[49] Morbidity and Mortality Weekly Report, Surveillance Summaries, Surveillance for Asthma 1980-1999: CDC. March 29, 2002; Asthma Prevalence, Health Care Use and Mortality, 2000-2001: www.cdc.gov.
[50] *Asthma Prevalence, Health Care Use and Mortality, 2000-2001*: www.cdc.gov. Accessed 12/01/03
[51] National Heart, Lung, and Blood Institute, (NHLBI) Chartbook, 2002: www.nhlbi.nih.gov/resources/docs/02_chtbk.pdf .
[52] Institute of Medicine, National Academy of Sciences. U.S. Committee on the Assessment of Asthma and Indoor Air. *Clearing the Air: Asthma and Indoor Air Exposures.* 2000. Washington. National Academy Press.

diseases.[53] ShS contains more than 4,000 substances of which more than 40 are known as carcinogens under the EPA Carcinogen Assessment Guidelines.[54]

Children 6 & Under Regularly Exposed to Secondhand Smoke at Home



Source: National Center for Health Statistics, National

- In 1999, indoor air quality was reported to be unsatisfactory in about one in five schools in the U.S., while ventilation was reported as unsatisfactory in about one-quarter of public schools. This translates to over 11 million students attending public schools reporting unsatisfactory indoor air quality and about 14 million students attending public schools reporting unsatisfactory ventilation.[55]

- Radon is the second leading cause of lung cancer and is estimated to be responsible for an estimated 21,000 deaths per year.[56] In 1992, EPA estimated that nearly one out of every 15 homes had radon concentrations above the EPA recommended action level.[57]

- Molds have the potential to cause health problems. Molds produce allergens, irritants, and in some cases, potentially toxic substances. Inhaling or touching mold or mold spores may cause allergic reactions in sensitive individuals. Allergic responses include hay fever-type symptoms, such as runny nose, red eyes, and skin rash. Allergic reactions to mold are common. They can be immediate or delayed. Molds can also cause asthma attacks in people with asthma who are allergic to mold. In addition, mold exposure can irritate the eyes, skin, nose, throat, and lungs of both mold-allergic and non-allergic people.[58]

Indoor environments program strategies. EPA implements two primary strategies to meet its human health objective to improve indoor air quality. These strategies focus on protecting sensitive populations, including children and the elderly, as well as the chronically ill.

Increase Public Awareness: EPA raises public awareness of actual and potential indoor air risks so that individuals can take steps to reduce exposure. Outreach activities, in the form of educational literature, media campaigns, hotlines, and clearinghouse operations, provide essential information about indoor air health risks not only to the public, but to the professional and research communities as well. Underpinning EPA's outreach effort is a strong commitment to environmental justice, community-based risk reduction, and customer service.

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[53] Results of a national telephone survey entitled "Radon Risk Communication and Results Study," commissioned by EPA in 1994. EPA expects updated results in 2004.

[54] U.S. Environmental Protection Agency. Respiratory Health Effects of Passive Smoking. 1993. Available at http://www.epa.gov/iaq/pubs/etsfs.html Accessed 12/22/03.

[55] *Condition of America's Public School Facilities: 1999,* National Center for Education Statistics, Office of Educational Research and Improvement, U.S. Department of Education, NCES2000-032, June 2000.

[56] U.S. Environmental Protection Agency. EPA Assessment of Risks from Radon in Homes. June 2003.

[57] *National Residential Radon Survey, 1992.*

[58] Institute of Medicine, National Academy of Sciences (U.S.). Committee on the Assessment of Asthma and Indoor Air. *Clearing the Air: Asthma and Indoor Air Exposures.* 2000. Washington. National Academy Press.

Increase Partnerships: Through partnerships with non-governmental and professional entities, EPA disseminates multi-media materials encouraging individuals, schools, and industry to take action to reduce health risks in their indoor environments. In addition, EPA uses technology transfer to improve the ways in which all types of buildings, including schools, homes, and workplaces, are designed, operated, and maintained. To support these voluntary approaches, EPA incorporates the most current science available as the basis for recommending ways that people can reduce exposure to indoor contaminants.

To reach people at the community level, EPA uses assistance agreements and cooperative partnerships to collaborate with organizations such as the American Academy of Pediatrics, the Asthma and Allergy Foundation of America, the National Association of Counties, the National Education Association, the American Lung Association, the Consumer Federation of America, and the National Environmental Health Association. These partnerships allow EPA to successfully reach and educate target audiences with messages about how to reduce public health risks posed by indoor air contaminants. Targeted audiences include: health care providers who treat children with asthma, school personnel who manage the environments where children spend many hours each day, county and local environmental health officials, and disproportionately affected and disadvantaged populations. Through this national partner network of over 100 state, local, and nonprofit organizations and more than 1,000 local field affiliates, EPA leverages the personnel, expertise, and credibility of these groups to provide the tools to their target audiences, and to the general public, to make informed decisions about reducing health risks in their indoor environment.

EPA broadens awareness and encourages action through national organizations focused on addressing indoor asthma triggers, as well as other indoor health risks, and partners with other local community-based organizations for implementation. These agreements will provide maximum flexibility for states and communities to design programs that address critical indoor air quality problems, including radon, asthma, mold contamination, and secondhand smoke in homes, child care, and school facilities, and other residential environments.

Results to be Achieved under this Objective

Indoor Air: Asthma

Although there is no known cure for asthma at this time, the medical community agrees, and it is established in national, evidence-based guidelines,[59] that both pharmacologic treatment and environmental management are needed to effectively control asthma. However, indoor environmental management is often not practiced and often not part of the prescription for managing asthma. Beginning in 1999, in accord with the President's Task Force on Environmental Health Risks and Safety Risks to Children (co-chaired by EPA and CDC), EPA launched a national, multi-faceted asthma education and outreach program that stresses the importance of incorporating environmental management into asthma education, outreach, and management strategies. The initiative, which primarily focuses on populations disproportionately impacted by asthma, is based on *Asthma and the Environment: A Strategy to Protect Children*, which currently serves as the framework for the Department of Health and

[59] NIH Publication No. 02-5075, June 2002 at http://www.nhlbi.nih.gov

Human Services (HHS), EPA, and other Federal agencies to collaborate on asthma issues.[60]

In FY 2005, the EPA will build on the success of our national, multi-faceted asthma education and outreach program designed to improve and expand the delivery of comprehensive asthma care programs to reach more people, more effectively. This program reaches out to the general public; schools and child care communities; and the health care community through partnerships with Federal agencies and non-governmental organizations committed to improving the quality of life for children with asthma. EPA will continue to implement our asthma program through:

- National public awareness and media campaigns
- Community-based outreach and education, and
- Enhancement and application of programmatic support data

EPA expects, as a result of Agency programs, that well over three quarters of a million people will be living in healthier residential indoor environments in FY 2005.

National public awareness and media campaigns: Through public awareness and media campaigns, EPA strives to raise the public's awareness about asthma and indoor environmental triggers and the importance of prompt action to reduce exposure to indoor triggers as part of a comprehensive asthma management plan. In FY 2005, EPA will continue to expand efforts to reach populations disproportionately impacted by asthma.

EPA's national public service announcement (PSA) campaign, "fish out of water," effectively targets low-income adults and children who are disproportionately impacted by asthma. This campaign – launched in May 2001 -- generated more than 400,000 web visits to the No-Attacks website, as well as 11,000 hot-line calls during the first year of the campaign. Additionally, a tracking study conducted after the first six months of the campaign indicated that viewers of the PSA reported a 20% increase in activities related to managing their asthma.[61] In September 2003 EPA released a second PSA that continues to build upon the success of the first wave. In FY 2004 and 2005, EPA will build on the campaign's continuing momentum to create both targeted outreach and a third PSA directed at an urban audience with limited reading skills. EPA plans to accomplish this through development of a website and educational publications specifically designed to reach this audience.

World Asthma Day, established in 1999 by the Global Initiative for Asthma, is a joint project of the World Health Organization and the National Heart, Lung, and Blood Institute at the National Institutes of Health. For the past two years, EPA has supported efforts to generate local events designed to raise public awareness about asthma and encourage the incorporation of environmental management as a component of comprehensive asthma management. For example, in FY 2002, EPA developed a World Asthma Day event planning kit, which provides ideas for planning asthma events in schools, hospitals, state capitol buildings, or other community settings. EPA's promotion of the new World Asthma Day Event Planning Kit in FY 2003 motivated more than 1,000 school nurses, health clinics, hospitals, local health departments and other asthma organizations and educators to order EPA environmental asthma educational

[60] President's Task Force on Environmental Health Risks and Safety Risks to Children. January 28, 1999. Revised May 2000.
[61] Ad Council summary report. Available on request from USEPA, Indoor Environments Division.

materials to support local outreach activities during the month of May. EPA doubled its goal, which was to raise awareness and motivate 500 individuals or organizations to sponsor asthma education events in their local communities. Additionally, 156 organizations listed their World Asthma Day events on EPA's web site so that families across the country could locate and participate in an event in their area. In FY 2004 and 2005, we will work with other Federal agencies and our partnering organizations to capitalize on past efforts to raise awareness and motivate over 1000 individuals or organizations to sponsor asthma education events in their local communities.

Community-based outreach and education: EPA partners with non-governmental organizations and Federal agencies to implement community-based outreach and education activities designed for schools and child care communities, the public, and the health care community. In FY 2005, EPA will continue to work with our partnering organizations to expand programs offered to these communities. Additionally, EPA will develop multi-media materials designed for people with limited-reading skills to support community-based outreach and education activities.

Schools and Child Care: EPA is committed to supporting school and child care programs that teach children, school officials, child care providers, and parents about asthma management, including the control of indoor environmental triggers. By working with nongovernmental organizations and established school-based and child-care asthma education programs, through FY 2003 we have:

- Held over 2,000 *Open Airways for Schools* education classes, educating nearly 14,000 students with asthma (Source: American Lung Association cooperative partner status reports).
- Trained more than 3,000 school nurses—providing service and one-on-one education for more than 48,000 children with asthma (Source: National Association of School Nurses cooperative partner status reports).
- Trained over 6,000 child-care providers nationwide. Approximately 90% of the 76participants implemented changes in the child-care setting to reduce exposures to indoor asthma triggers influencing indoor air quality for approximately 50,500 children, of which an estimated 12,000 have asthma (Source: Asthma and Allergy Foundation of America cooperative partner status reports).

In FY 2005, EPA will increase the level of work accomplished in the past by continuing to support national organizations with existing, results-based school and day-care asthma education programs. EPA will also continue to coordinate internally to ensure that asthma management in the school and child-care setting is efficiently addressed.

In-home asthma education**:** For the past three years, EPA has sponsored community-based, in-home asthma environmental education and management interventions through a competitive grant process. These grants support existing community-based, in–home programs to develop performance-based pilot asthma education and management programs that educate families about how to control indoor environmental triggers in their homes. In FY 2003 the first two grantees completed their projects. For example, the Community Asthma Prevention Program at the Children's Hospital of Philadelphia showed reductions in the number of children with emergency room visits (60%) and hospitalizations (34%) for asthma as a result of their in-

home environmental intervention program (Source: status report from grantee). In FY 2004, EPA will maintain its comprehensive program by managing existing grants, awarding new grants, and highlighting effective program strategies. In FY 2005, EPA will refine strategic directions using the information gained from these projects and continue to maintain our comprehensive program. Additionally, EPA will disseminate a series of case studies to support adoption of best practices determined to be most effective at teaching practical skills as well as motivating behavioral change.

In FY 2004, EPA also will support efforts to educate parents with limited reading skills who have children with asthma by developing outreach publications such as an asthma brochure, a children's activity book, and videos on asthma triggers (all of which will be available in Spanish and English). These publications, designed to supplement existing community-based outreach and education programs, will assist in efforts to reach audiences disproportionately impacted by asthma. In FY 2005, EPA will continue outreach efforts and, where appropriate, update publications based on feedback received from target audiences.

Health Care Communities: Through partnerships with the medical and health insurance communities, EPA promotes the incorporation of environmental controls into clinical practices and standards of care. We accomplish this by raising the health care community's awareness of environmental risk factors and encouraging public and private health insurers to develop comprehensive asthma management programs. For example, through FY 2003, EPA has:

- Trained over 150 health care providers in health clinics nation-wide, reaching approximately 25,000 asthma patients (Source: Bureau of Primary Health Care semi-annual status reports).

- Educated 600 pediatric patients and their families and trained 2,400 respiratory therapists, ultimately educating up to 15,000 asthma patients (Source: American Respiratory Care Foundation annual cooperative partner status report).

- Trained 360 health care professionals to provide integrated environmental trigger control and asthma management education to patients (Source: Asthma and Allergy Foundation of America annual cooperative partner status report).

In FY 2004 and 2005, we will continue to leverage relationships with Federal agencies (such as the Department of Health and Human Services) and key healthcare organizations to integrate environmental controls into clinical practices and standards of care as well as collaborate with health plans to integrate environmental management into comprehensive asthma care management programs.

In FY 2004, EPA also will develop materials to support outreach efforts to the health care community. The "Asthma Home Environment Checklist," will provide the information necessary to include (or strengthen) an environmental assessment component of a home visit program. The "How to Get Started Guide," will assist health plans in developing an in-home visit program offered to asthma disease management program participants. Finally, EPA will develop case studies highlighting successful asthma care management programs demonstrating effective integration of environmental controls and distribute these to the health care community

in an effort to replicate effective approaches. In FY 2005, EPA will update publications based on feedback received from target audiences.

Enhancement and Application of Programmatic Support Data: While asthma cannot be prevented or cured and continues to be a major public health problem in the U.S., national experts agree that it can be controlled with medical treatment and management of environmental triggers, which includes indoor allergens, secondhand smoke, and outdoor air pollutants.[62] Recent data suggest an overall downward trend in asthma hospitalizations and asthma mortality that may indicate early successes by asthma intervention programs since 1991. It is notable that African-Americans, however, continue to have higher rates of emergency room visits, hospitalizations, and deaths related to asthma than do Caucasians.[63]

Building on the National Academy of Science's report,[64] in FY 2004 and 2005, EPA will continue to evaluate emerging scientific evidence supporting the link between environmental exposures and asthma.

EPA supports several studies to advance the understanding of the role environmental triggers play as a component of comprehensive asthma management, as well as to quantify the impact our program has at the national level. For example, in FY 2003, EPA:

- Conducted a nation-wide telephone survey to assess awareness and action regarding indoor environmental asthma triggers. In FY 2004, EPA will complete the analysis and communicate results from the national survey. This information will help inform the strategic program direction for FY 2005.
- Collaborated with the University of Michigan, School of Public Health, to determine best practices and interventions of asthma management programs achieving health outcomes. In FY 2004, EPA will produce a review based on this work that will provide guidance for EPA outreach and education programs. In addition, this work will form the basis of a "real-time" repository of information and resources to support and enhance national asthma management programs. In FY 2005, EPA and its partners will continue to evaluate emerging programs and update the repository.
- Assisted our partnering organizations to develop strong evaluation components to their outreach and education programs. In both FY 2004 and 2005, EPA will continue to provide support and technical assistance to track and report initiative results.

Additional Asthma Programs: EPA also will target low-income adults with asthma and disproportionately impacted members of the public who are more vulnerable to poor indoor conditions such as the elderly. For example, in FY 2003, EPA conducted a comprehensive literature search on indoor health risks for the elderly, and convened a group of more than 20 stakeholders to discuss indoor environment issues that impact aging populations directly. As an outgrowth of that meeting, EPA is collaborating in FY 2004 with organizations that advocate for

[62] Institute of Medicine, National Academy of Sciences (U.S.). Committee on the Assessment of Asthma and Indoor Air. *Clearing the Air: Asthma and Indoor Air Exposures.* 2000. Washington. National Academy Press.
[63] Centers for Disease Control. "Asthma Prevalence, Health Care and Use Mortality, 2000-2001". Available at www.cdc.gov/nceh/airpollution/asthma/asthmadata.htm Accessed December 23, 2003.
[64] Clearing the Air: Asthma and Indoor Air Exposures. ISBN 0-309-06496-1. January 2000.

the protection of the elderly to focus selected outreach and education efforts on reducing exposure to possible indoor environmental contaminants. In FY 2005, these efforts will be expanded as part of a cross-Agency strategy to improve the environmental health of the elderly.

Indoor Air: Schools and Workplace Programs

Schools: Schools and school districts across the nation are realizing the benefits of improved indoor air quality after successfully implementing the indoor air quality (IAQ) Tools for Schools (TfS) kit and Program. In 2002, a national survey of school operation and maintenance practices of a representative sample of schools was completed. The survey used a comprehensive database of private and public schools and helped estimate the number of schools adopting and implementing IAQ practices consistent with EPA's IAQ TfS guidance. The key finding was that 22% percent of respondents had IAQ management plans, consistent with EPA guidelines. EPA will continue to update its schools materials as new information becomes available, and as it analyzes information from schools case studies about how implementation proceeded and what costs and benefits were realized.

In FY 2005, EPA will continue to build on the success of its national IAQ TfS program (www.epa.gov/iaq/schools) and expand implementation of this program to more schools. Adoption of EPA's guidelines for proper operation and maintenance of school facilities results in healthier indoor environments for all students and staff, but is of particular help to children with asthma, lessening the degree to which they are exposed to indoor asthma triggers. By increasing the number of schools where TfS indoor air quality guidelines are adopted and implemented, healthier indoor air will be provided for over a million students, staff, and faculty. As the program grows, EPA continues to be particularly concerned about those schools in inner city areas that are experiencing significant facility deterioration, but have extremely limited funding for repair or replacement. These schools represent a distinct challenge for TfS adoption and we continue to target this population by working collaboratively with several urban school-based organizations to determine appropriate strategies to encourage adoption of indoor air quality guidelines.

In 2003, EPA released an additional tool in the TFS program, *Design Tools for Schools* (DTfS) (www.epa.gov/iaq/schooldesign). DTfS is web-based guidance to assist school districts in integrating indoor environmental quality and high performance goals into the design, construction, and renovation of school buildings. In FY 2005, the program will continue to increase the number of existing and new schools that protect students and staff from the health risks posed by poor school environments. EPA will actively seek feedback from users of the newer DTfS design guidance to refine the information we offer to the target community. To increase awareness of the TfS Program and the DTfS guidance, the Agency will continue to partner with various non-governmental organizations to promote widespread adoption, including sponsoring an annual schools symposium, bringing together school officials, nurses, teachers, facility managers and planners, parents, and others to discuss current issues and the potential negative effect poor indoor air quality can have on our children's health.

In FY 2003, the IAQ Tools for Schools National Symposium attracted well over 500 participants with attendance growing each year since its inception in FY 2000, indicating growing interest on the part of schools and school districts nationwide. In 2003, the Symposium coincided with Children's Health Month and featured nationally renowned experts speaking on

topics of vital interest to the school community. Increasing numbers of school decision-makers such as superintendents, school business officials, facility managers, and school board officials attended the symposium.

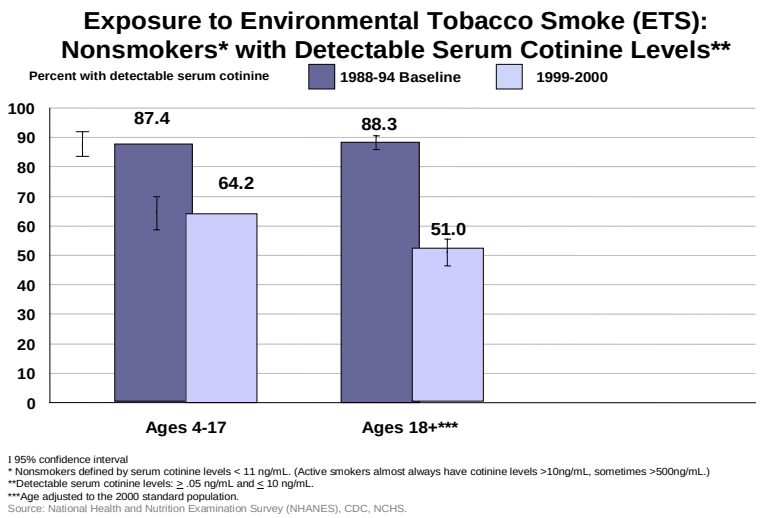
In FY 2005, EPA will continue to expand its efforts to address children's asthma health concerns in schools by funding implementation of comprehensive environmental and asthma management systems that use IAQ Tools for Schools as the framework for addressing all potential asthma-related children's health risks in school environments. Indoor air is the primary exposure route to asthma triggers as well as to a wide range of chemical respiratory irritants commonly found in and around schools (e.g., science labs, art supplies, cleaning agents, and pesticides) that may also be associated with exacerbation of asthma. In addition, exposure to school bus diesel exhaust is linked to asthma.[65]

EPA also will expand the number of schools in which school-based asthma education programs, such as the American Lung Association's (ALA) *"Open Airways"* and the National Association of School Nurses' (NASN) *"Managing Asthma Triggers: Keeping Students Healthy,"* are offered. We will continue to place emphasis on reaching inner city schools with disproportionately affected populations. These programs teach students with asthma to identify and control their exposure to asthma triggers in their environment and help staff and teachers understand the steps they can take to improve their school's asthma management.

IAQ TfS is a proven environmental management system for schools that stresses teamwork, comprehensive "whole building" strategies, and multi-media approaches, as schools struggle to finance critical education priorities while ensuring a safe and healthy learning environment for children, it is critical that the Federal government better integrate its existing environmental management programs for schools. This integration, through IAQ TfS, allows schools to efficiently manage their limited resources so they can target the most pressing environmental health issues, such as asthma. EPA will continue to fund several national, regional, or community based results-oriented programs that utilize a multi-media approach to addressing all potential asthma triggers, through effective and innovative integration of existing proven programs such as IAQ TfS and Open Airways for Schools as well as programs addressing other environmental triggers of asthma.

Workplaces: In FY 2005, EPA will continue to use its premiere tool, Indoor Air Quality—Building Education and Assessment Model (I-BEAM) to aid office building owners and managers to understand the benefits of good indoor air quality in their buildings and how to achieve it (www.epa.gov/iaq/largebldgs/ibeam_page.htm). This tool informs building owners and managers of the proactive steps to improve indoor air quality thereby improving the health and productivity of their office workers. We will continue to expand our efforts to inform our targeted audience through additional partnerships. Over 35,000 copies of guidance documents related to building air quality, e.g., "Building Air Quality, A Guide for Building Owners and Facility Managers, 1991," I-BEAM, and "Mold Remediation in Schools and Commercial Buildings," are downloaded from www.epa.gov/iaq every month.

[65] Health Assessment Document for Diesel Engine Exhaust. USEPA EPA/600/8-90/057F. 01 May 2002. U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Washington, DC).



EPA addresses secondhand smoke (ShS) risks as part of its overall program to educate the public about indoor air pollution. Although EPA's mission addresses all involuntary exposure to ShS, EPA is particularly concerned about the risks to millions of children age 6 and younger. While secondhand smoke is a health risk for everyone exposed, very young children are especially vulnerable because their respiratory, immune, and nervous systems are still developing. Children are most likely to be exposed in homes with smokers, but may also be exposed in other settings, such as in cars, day care facilities and schools, and public buildings.

As of 1998, 20% of young children aged six and below were regularly exposed to ShS in U.S. homes.[66] EPA estimates that exposure to ShS contributes 150,000 to 300,000 lower respiratory tract infections annually in infants and children up to 18 months of age, resulting in up to 15,000 cases requiring hospitalization.[67] ShS exposure is causally associated with an increased risk of acute and chronic middle ear disease.[68] Asthmatic children are especially at risk, as ShS exposure increases the number of episodes and severity of symptoms for up to a million asthmatic children.[69] Additional findings related to the health effects of ShS suggest links between ShS exposure and sudden infant death syndrome.[70]

Smoke free environments are the most effective method for reducing ShS exposure. Healthy People 2010 (http://www.healthypeople.gov) objectives address this issue and seek optimal protection of nonsmokers through policies and actions that promote smoke-free environments in schools, work sites, and public places. The two Healthy People 2010 objectives most relevant to EPA's ShS program are: (1) Reduce the proportion of children age 6 and under who are regularly exposed to tobacco smoke at home from 27% in 1994 to 10% in 2010, and (2) Reduce the proportion of nonsmokers exposed to environmental tobacco smoke from 65% of nonsmokers aged 4 years and older (defined as having a serum cotinine level above 0.10ng/mL in 1988-94 (age adjusted to the year 2000 standard population)) to 45% by 2010.[71]

Nicotine, one of more than 4,000 chemicals found in the smoke from tobacco products such as cigarettes, cigars, and pipes, is metabolized in the body into several components.

[66] N*ational Health Interview Survey*, DHHS, 1998. ETS exposure increases the risk of lower respiratory tract infections such as bronchitis and pneumonia (*Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*, U.S. EPA, December 1992)
[67] *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*, U.S. EPA, December 1992.
[68] *International Consultation on ETS and Child Health Report*, World Health Organization, January 1999
[69] *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*, U.S. EPA, December 1992
[70] Health Effects of Exposure to Environmental Tobacco Smoke, California EPA, September 1997.
[71] National Health and Nutrition Examination Survey (NHANES), NCHS, CDC.

Cotinine, one of the major metabolites, persists in the body and is considered a very good biomarker of exposure. Exposure can be measured by analyzing the cotinine levels in the blood, saliva, urine, or hair. While cotinine persists in the body for only a discrete amount of time and is therefore only a good short-term indicator of ShS exposure, EPA has begun to use cotinine measurement as a tool to indicate short-term dose to ShS exposure from all environments (note: cotinine cannot be isolated or differentiated between home exposure versus other exposures (e.g., from a daily child care provider), given currently collected data. Based on the most current data, cotinine levels have fallen significantly among non-smokers over the last several years.

EPA is pursuing a multi-media effort on ShS to promote behavior change associated with children's exposure to ShS. In April, 2003, EPA, under a cooperative agreement with a national partner, launched a Public Service Campaign entitled, "My Mom's My Hero," to motivate parents to make their homes smoke free. It is estimated that this PSA has received approximately $10.3 million in donated media time and 100,000 airings (from April 2003 - October 2003).[72] In 2004, EPA anticipates continued outreach with a 30-minute educational video which will follow a smaller, more targeted distribution method (unlike the previous mass media distribution). The distribution is tentatively planned to be given to approximately 5,000 physicians and aired on select TV outlets. In FY 2005, there will be continued results from the FY 2004 project as well as potential media results from an independent media outreach collaboration between the Ad Council and the American Legacy Foundation that involves no EPA resources.

The Agency also provides technical support directly to state, local government, and public health organizations to develop and make available tools and resources that promote behavior changes in parents and guardians that result in smoke-free homes. In 2003, it is estimated that there were 400+ partner organizations in the ShS database with an additional 300+ calls for technical assistance from organizations other than those currently listed. In FY 2004 and FY 2005 there will be a continued effort to develop new partnerships. The Agency expects to double the numbers of partners in FY 2004 and projects an additional increase of 50% in FY 2005.

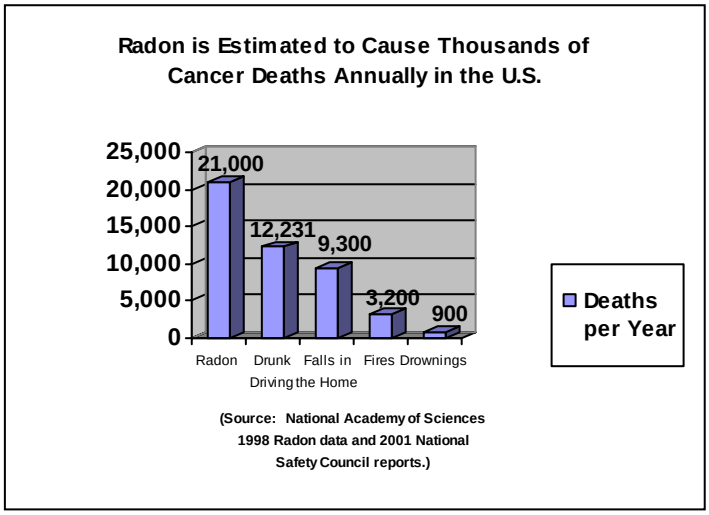
Additionally, EPA is focusing on expanding participation in the "Smoke Free Homes Pledge" program, which targets the parents of young children, advising them of the health consequences of exposing children to secondhand smoke inside the home. Through calendar year 2003, approximately 12,000 Smoke-free Home Pledges were tracked through the hotline and the web. With the increase in partner organization activity and momentum, the Smoke-free Homes Programs projects an additional 17,000 pledges in FY 2004 and 22,000 pledges in FY 2005. See http://www.epa.gov/smokefree for information on taking the "Smoke Free Home Pledge" or to view the PSA, "My Mom's My Hero."

In FY 2003, the Agency, through a competitive selection process, awarded two Cooperative Agreements. The first focused on changing clinical practices in pediatric offices to heighten parent awareness and promote smoke-free homes, and the other concentrated on disparities and reducing risk among at-risk populations. Through FY 2004 and FY 2005, EPA will continue to provide competitive funding to organizations that provide real-life results and inform the Agency about approaches that achieve results.

[72] Consumer Federation of America Foundation. Independent Tracking 2003.

EPA is also working closely with CDC on developing the U.S. position on ShS for the Framework Convention on Tobacco Control (FCTC). The FCTC is an international treaty to address all aspects of tobacco control, including health, trade, advertising, and taxation. The World Health Organization recently adopted a final draft of the treaty and the Interagency Working Group has recommended that the White House sign the treaty.

Indoor Air: Radon Program/ Categorical Grant: Radon



Radon, a naturally occurring radioactive gas, is the second leading cause of lung cancer in the United States. It is estimated to cause about 21,000 lung cancer deaths each year.[73] Radon enters the indoor air primarily from soil under homes and other buildings. Found all over the U.S., radon comes from the radioactive decay of uranium in soil, rock, and groundwater. It emits ionizing radiation during its radioactive decay to several radioactive isotopes known as radon decay products. Radon is a known human lung carcinogen and is the largest source of radiation exposure and risk to the general public. Most inhaled radon is rapidly exhaled, but the inhaled decay products readily deposit in the lungs, where they irradiate sensitive cells in the airways increasing the risk of lung cancer. Radon typically moves up through the ground to the air above and into the home through cracks and other holes in the foundation.

In 1988 Congress passed the Indoor Radon Abatement Act of 1988[74] directing the EPA to work toward a long term national goal: "The air within buildings in the United States should be as free of radon as the ambient air outside of buildings." EPA's indoor radon program promotes voluntary public actions to reduce the risks from indoor radon. EPA and the U.S. Surgeon General recommend that people do a simple home test and if levels above EPA's guidelines are confirmed, reduce those levels by a home mitigation using straight-forward techniques. It is also recommended that new homes be built radon-resistant using techniques described in national building codes.[75] Since the mid-1980s, there has been significant progress in reducing the risk from exposure to radon. This progress is the result of continued efforts between EPA, citizens, non-profit organizations, state and local governments, the business community, and other Federal agencies working together. Through the State Indoor Radon Grant Program, EPA provides assistance through categorical grants to the states to develop, implement, and enhance programs to assess and mitigate radon risks.

[73] EPA Assessment of Risks from Radon in Homes. U.S. EPA. 2003. EPA 402-R-03-003.
[74] CFR. Title 15-Commerce and Trade, Chapter 53-Toxics Substance Control, Subchapter III – Indoor Radon Abatement
[75] National Fire Protection Association 5000, International Residential Code 2003

In June 2003, EPA updated its risk assessment for radon. The results show that EPA had underestimated the risk from radon.[76] Given the revised estimates of increased risk, in FY 2004 and FY 2005, EPA will continue to promote public action to test homes for indoor radon, reduce elevated levels, and build new homes in high radon areas with radon-resistant features while highlighting the risk information. This will continue to be accomplished through national outreach and education campaigns in collaboration with the states, private non-profit organizations, Tribes, and other Federal agencies such as the U.S. Department of Agriculture Cooperative Research, Extension, and Education Service.

Through FY 2003, EPA conservatively estimates that 690,000 homes have been mitigated based on existing consumer surveys conducted before 1996 and radon mitigation fan sales provided by the three major U.S. radon vent fan manufacturers after 1996. In the last year for which data were available (2002), approximately 70,000 homes were mitigated.

Based on an annual survey of builder home building practices done by the National Association of Home Builders Research Center, the number of homes built radon resistant from 1990-2001 is estimated to be 1,015,000 with 610,000 of those homes being located in high radon potential areas (Zone 1). Approximately 560 lives are saved annually from radon mitigation and radon-resistant new construction performed to date.[77]

FY 2005 CHANGE FROM FY 2004

EPM

- (+ 3.0 FTE): This increase shows a redirection of workyears from within Goal 1 to expand our outreach efforts on innovative ways to reduce health risks from asthma and indoor air. With more resources in implementation we will be able to increase our outreach efforts to inform and educate the public about the effects of poor indoor air quality and indoor air pollutants and steps they can take to improve the indoor air quality in their schools, residences and workplaces.

- There are additional increases for payroll, cost of living, and enrichment for new and existing FTE.

ANNUAL PERFORMANCE GOALS AND MEASURES

Healthier Residential Indoor Air

In 2005	843,300 additional people will be living in homes with healthier indoor air.
In 2004	834,400 additional people will be living in healthier residential indoor environments.
In 2003	End-of-year FY 2003 data will be available in late 2004 to verify that 834,400 additional people were living in healthier residential indoor environments.

[76] U.S. Environmental Protection Agency. EPA Assessment of Risks from Radon in Homes. June 2003. Available at http://www.epa.gov/radiation/docs/assessment/radon_in_homes.pdf

[77] Based on U.S. EPA's updated risk assessment for radon, *EPA Assessment of Risks from Radon in Homes* (June 2003), and the methodology outlined in EPA's *Technical Support Document for the 1992 Citizen's Guide to Radon.*

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
People Living in Healthier Indoor Air	Data Lag	834,400	843300	People

Baseline: 1. By 2005, increase the number of people living in homes built with radon reducing features to 4,539,000 from 1,862,280 in 1994 (cumulative) .* 2. By 2005, decrease the number of children exposed to ETS from 27,502,000 in 1994 to 24,119,404 (cumulative) .** 3. By 2005, increase by 500,000 the number of people with asthma and their caregivers who are educated about indoor air asthma triggers. * The 1994 baseline for the number of new homes built with radon-resistant design features has changed from 684,000 t0 384,000. This is due to a recent review of historical NAHB Research Center reports wehich determined that a significant number of "rough-in" installations were reported as radon-resistant new construction. "Rough-in" installations are not complete radon-reduction systems and do not provide any risk reduction, and they should not be considered when estimating the number of homes built with radon-resistant new construction. In order to improve the integrity of the results that are being reported, EPA is dropping homes with rough-in installations when estimating the amount of homes built with radon-resistant construction. The baseline of existing homes mitigated remains the same at 300,000 in 1994.

** The 1995 Census Report that EPA was using for a baseline population (19,500,000) for children 0 to 6 years of age represented only childeren 0 to 4 years of age. This recently came to our attention after an internal review of the baselines. The actual baseline population of children from the ages of 0 to 6 should be 27,502,168. In order to improve the integrity of the results that are being reported, EPA is correcting the baseline population to the comprehensive number which includes the ages 0 to 6 years old. Our 2005 goal of decreasing the percentage of childern exposed, remains at 15% and the starting point remains at 27.3%.

Healthier Indoor Air in Schools

In 2005 1,312,500 students, faculty and staff will experience improved indoor air quality in their schools.

In 2004 1,575,000 students, faculty and staff will experience improved indoor air quality in their schools.

In 2003 End-of-year FY 2003 data will be available in late 2004 to verify that 1,050,000 students, faculty and staff experienced improved indoor air quality in their schools.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Students/Staff Experiencing Improved IAQ in Schools	Data Lag	1,575,000	1312500	Students/Staff

Baseline: The nation has approximately 117,000* schools with an average of 525 students, faculty and staff occupying them for a total baseline population of 61,425,000. The IAQ "Tools for Schools" Guidance implementation began in 1997. For FY 2004, the program projects an additional 3,000 schools will implement the guidance and seeks to obtain implementation commitments from 15 of the 100 largest school districts in the U.S. with an average of 140,000 per district. (Additional, not cumulative since there is not an established baseline for good IAQ practices in schools.)

* According to the U.S. Department of Education National Center for Education Statistics, between 1994 and 2002, 7,000 new schools were built. For the revised strategic plan we increased our baseline to incorporate the increase. Our FY 2008 strategic goal incorporates the additional school.

Healthier Indoor Air in Workplaces

In 2005 150,000 additional office workers will experience improved air quality in their workplaces.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
150,000 additional office workers will experience improved air quality in their workplaces.			150,000	People

Baseline: There are approximately 750,000 office buildings with 12 billion square feet. The mean worker density is 1 office worker per 500 square feet. Therefore, a total of 24 million office workers work in office buildings. Our 2005 goal is to get 5% of all office buildings to adopt good IAQ measures which translates into 1.2 million office workers (cumulative from 1994). Our 2008 goal is to get an additional 3% of all office buildings to adopt good IAQ measures which translates to 720,000 office workers (cumulative at 240,000 per year).

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Overarching Performance Measure: People Living in Healthier Indoor Air

FY 2005 Performance Measure: People Living in Radon Resistant Homes

Performance Database: Survey

Data Source: The survey is an annual sample of home builders in the United States most of whom are members of the National Association of Home Builders (NAHB). NAHB members construct 80% of the homes built in the United States each year. Using a survey methodology reviewed by EPA, NAHB Research Center estimates the percentage of these homes that are built radon resistant. The percentage built radon resistant from the sample is then used to estimate what percent of all homes built nationwide are radon resistant**.** To calculate the number of people living in radon resistant homes, EPA assumes an average of 2.67 people per household. NAHB Research Center has been conducting this annual builder practices survey for over a decade, and has developed substantial expertise in the survey's design, implementation, and analysis. The statistical estimates are typically reported with a 95 percent confidence interval.

Methods, Assumptions, and Suitability: NAHB Research Center conducts an annual survey of home builders in the United States to assess a wide range of builder practices. NAHB Research Center voluntarily conducts this survey to maintain an awareness of industry trends in order to improve American housing and to be responsive to the needs of the home building industry. The annual survey gathers information such as types of houses built, lot sizes, foundation designs, types of lumber used, types of doors and windows used, etc. The NAHB Research Center Builder Survey also gathers information on the use of radon-resistant design features in new houses, and these questions comprise about two percent of the survey questionnaire.

In January of each year, the survey of building practices for the preceding calendar year is typically mailed out to home builders. For the most-recently completed survey, for building practices during calendar year 2001, NAHB Research Center reported mailing the survey to about 44,000 active United States home building companies, and received about 2,800 responses

which translates to a response rate of about 6.4 percent. This is the response rate for the entire survey. The survey responses are analyzed with respect to State market areas and Census Divisions in the United States, and are analyzed to assess the percentage and number of homes built each year that incorporate radon-reducing features. The data are also used to assess the percentage and number of homes built with radon-reducing features in high radon potential areas in the United States (high risk areas). Other analyses include radon-reducing features as a function of housing type, foundation type, and different techniques for radon-resistant new home construction. The data are suitable for year-to-year comparisons.

QA/QC Procedures: Because data are obtained from an external organization, QA/QC procedures are not entirely known. According to NAHB Research Center, QA/QC procedures have been established, which includes QA/QC by the vendor that is utilized for key entry of data.

Data Quality Review: Because data are obtained from an external organization, Data Quality Review procedures are not entirely known. NAHB Research Center indicates that each survey is manually reviewed, a process that requires several months to complete. The review includes data quality checks to ensure that the respondents understood the survey questions and answered the questions appropriately. NAHB Research Center also applies checks for open-ended questions to verify the appropriateness of the answers. In some cases, where open-ended questions request numerical information, the data are capped between the upper and lower three percent of the values provided in the survey responses. Also, a quality review of each year's draft report from NAHB Research Center is conducted by the EPA project officer.

Data Limitations: The majority of home builders surveyed are NAHB members. The NAHB Research Center survey also attempts to capture the activities of builders that are not members of NAHB. Home builders that are not members of NAHB are typically smaller, sporadic builders that in some cases build homes as a secondary profession. To augment the list of NAHB members in the survey sample, NAHB Research Center sends the survey to home builders identified from mailing lists of builder trade publications, such as Professional Builder magazine. There is some uncertainty as to whether the survey adequately characterizes the practices of builders who are not members of NAHB. The effects on the findings are not known.

Although an overall response rate of 6.4 percent could be considered low, it is the response rate for the entire survey, of which the radon-resistant new construction questions are only a very small portion. Builders responding to the survey would not be doing so principally due to their radon activities. Thus, a low response rate does not necessarily indicate a strong potential for a positive bias under the speculation that builders using radon-resistant construction would be more likely to respond to the survey. NAHB Research Center also makes efforts to reduce the potential for positive bias in the way the radon-related survey questions are presented.

Error Estimate: See Data Limitations

New/Improved Data or Systems: None

References: The results are published by the NAHB Research Center in annual reports of radon-resistant home building practices; see http://www.nahbrc.org/. The most recent report, "Builder Practices Report: Radon Reducing Features in New Construction 2001," Annual

Builder and Consumer Practices Surveys by the NAHB Research Center, Inc., January 2, 2003. Similar report titles exist for prior years.

FY 2005 Performance Measure: People Living in Radon Mitigated Homes

Performance Database: External

Data Source: Radon fan manufacturers report fan sales to the Agency. EPA assumes one fan per radon mitigated home and then multiplies it by the assumed average of 2.67 people per household.

Methods, Assumptions and Suitability: N/A.

QA/QC Procedures: Because data are obtained from fan manufacturers, EPA relies on the business practices for reporting data.

Data Quality Review: Data are obtained from fan manufacturers. EPA reviews the data to ascertain their reliability and discusses any irregularities with the relevant manufacturer.

Data Limitations: Reporting by radon fan manufacturers is voluntary and may underestimate the number of radon fans sold. Nevertheless, these are the best available data to determine the number of homes mitigated. There are other methods to mitigate radon including: passive mitigation techniques of sealing holes and cracks in floors and foundation walls, installing sealed covers over sump pits, installing one-way drain valves in untrapped drains, and installing static venting and ground covers in areas like crawl spaces. Because there are no data on the occurrence of these methods, there is again the possibility that the number of radon mitigated homes has been underestimated.
No radon vent fan manufacturer, vent fan motor maker or distributor is required to report to EPA; they provide data/information voluntarily to EPA. There are only four (4) radon vent fan manufacturers of any significance; one of these accounts for an estimated 70% of the market.

Error Estimate: N/A.

New/Improved Data or Systems: None

References: See http://www.epa.gov/iaq/radon/pubs/index.html for National performance/progress reporting (National Radon Results: 1985-1999) on radon, measurement, mitigation and radon-resistant new construction.

FY 2005 Performance Measure: Number of people with asthma who have taken steps to reduce their exposure to indoor environmental asthma triggers.

Performance Database: The performance database consists of quarterly Partner status reports used to document the outcomes of individual projects; a media tracking study used to assess behavior change within that sector of the public viewing the public service announcements; and a national telephone survey (*National Survey on Environmental Management of Asthma*) which

seeks information about the steps taken by people with asthma, and parents of children with asthma, to minimize exposure to indoor environmental asthma triggers. Additional information about asthma morbidity and mortality in the US is obtained from the Centers for Disease Control and Prevention (CDC). Annual expenditures for health and lost productivity due to asthma are obtained from the National Heart Lung and Blood Institute (NHLBI) Chartbook.

Data Source: Each component of the database has a unique source. Partner status reports are generated by those organizations receiving funding from EPA and are maintained by individual EPA Project Officers. An independent initiative of the Advertising Council provides media tracking of outcomes of all of their public service campaigns and this is publicly available information. The *National Survey on Environmental Management of Asthma* (OMB control number 2060-0490) source is EPA. Data on asthma morbidity and mortality is available from the National Center for Health Statistics at the CDC (www.cdc.gov/nchs). Data on annual expenditures for health and lost productivity due to asthma are obtained from the NHLBI Chartbook (www.nhlbi.nih.gov/resources/docs/02_chtbk.pdf).

Methods, Assumptions and Suitability:
Partner status reports: EPA requires all funded organizations to provide quarterly reports identifying the numbers of children, adults, and health care professionals educated about indoor asthma triggers, the numbers of homes, schools, and child care centers in which triggers have been identified, and the type of mitigation actions taken in these environments. In addition, decreases in the number of emergency room visits, hospitalizations, and other markers of asthma morbidity are requested from those partner organizations with access to such data. EPA believes that the information reflects progress made at achieving performance measures.

National Survey on Environmental Management of Asthma: (OMB control number 2060-0490): This survey is the most robust data set for this performance measure, but it is not administered annually. EPA has designed a survey instrument (telephonic survey) in consultation with staff from EPA and the CDC National Center for Health Statistics (NCHS) to ensure that respondents will understand the questions asked and will provide the type of data necessary to measure the Agency's objectives. In addition, care has been taken to ensure that the survey questions target the population with asthma by using the same qualifier question that appears on other national surveys on asthma collected by the CDC.

EPA estimates that of the 26,600 households which make up the sampling frame, 60 percent, or approximately 16,000, will be contacted successfully and will agree to participate in the screening survey. Of these approximately 16,000 individuals, EPA expects that 15 percent, or approximately 2,400 individuals, will either have asthma or live with someone who does. Only those individuals who have asthma or live with someone who does are considered to be eligible respondents.

Respondents are asked to provide primarily yes/no responses. In some cases, respondents are given a range of responses in the form of multiple choice questions and are asked to indicate the one which best defines their response. The survey seeks information on those environmental management measures that the Agency considers important in reducing an individual's exposure to known indoor environmental asthma triggers. By using yes/no and multiple choice questions, the Agency has substantially reduced the amount of time necessary for the respondent to complete the survey and has ensured consistency in data response and interpretation.

The information collected may be used to establish a baseline to accurately reflect the characteristics of our nation's asthma population and by which to evaluate progress made at achieving performance measures.

QA/QC Procedures: It is assumed that partner organizations report data as accurately and completely as possible; site-visits are conducted by EPA project officers as warranted. The National Survey is designed in accordance with approved Agency procedures. Additional information is available on the Internet: http://www.epa.gov/icr/players.html.

Data Quality Review: EPA reviews the data from all sources in the performance database to ascertain reliability and resolves any discrepancies.

Data Limitations: The primary limitation associated with Partner organization status reporting is that limitation inherent to self-reporting. For the National Survey, random digit dialing methodology is used to ensure that a representative sample of households has been contacted; however, the survey is subject to inherent limitations of voluntary telephone surveys of representative samples. Limitations of phone surveys include: 1) inconsistency of interviewers following survey directions (i.e., an interviewer might: ask the questions incorrectly or inadvertently lead the interviewee to a response); or 2) call at an inconvenient time. For example, the respondent might not want to be interrupted at the time of the call and may resent the intrusion of the phone call. The answers will reflect this attitude. In addition, a telephone survey is limited to those households with a telephone.

Error Estimate: The Agency expects to achieve results within the following percentage points of the true value at the 90 percent confidence level (survey instrument):

Adult Asthmatics	plus or minus 3.0%
Child Asthmatics	plus or minus 4.0%
Low Income Adult Asthmatics	plus or minus 6.5%

These precision rates are sufficient to characterize the extent to which the results measured by the survey accurately reflect the characteristics of our nation's asthmatic population.

New/Improved Data or Systems: Data from the *National Survey on Environmental Management of Asthma* (OMB control number 2060-0490) was collected from August 4-September 17, 2003 and represents the first data collection with this instrument.

References: National Center for Health Statistics, Centers for Disease Control and Prevention (www.cdc.gov/nchs)

NHLBI Chartbook (www.nhlbi.nih.gov/resources/docs/02_chtbk.pdf).

EPA Indoor Environments Division (www.epa.gov/iaq/).

Survey results will be available in early March 2004. Questions may be directed to the Indoor Environment Division.

FY 2005 Performance Measure: Number of Children under 6 not Exposed to Secondhand Smoke (ShS) in the Home.

Performance Databases: The performance database consists of Smoke-free Home Pledges that are tracked through a hotline and website and that are documented in a monthly pledge report generated by EPA staff; Cooperative Agreement Partner status reports used to document the outcomes of individual projects; a media tracking study used to assess behavior change within that sector of the public viewing ShS public service announcements; and a national telephone survey (*National Survey on Environmental Management of Asthma*) which includes a series of questions about whether respondents allow smoking in their home, and if so, whether young children are in the household. Expenditures for medical costs of childhood illness attributable to ShS were taken from an analysis of previous studies and reports on medical costs. Information about ShS in the US is obtained periodically from the Centers for Disease Control and Prevention (CDC) including the National Health Interview Survey (for use in benchmarking and national tobacco/ShS exposure data), the National Health and Nutrition Examination Survey (for use of cotinine data), and the Behavioral Risk Factor Surveillance Survey (for use of state tobacco/ShS exposure data).

Data Sources: Each component of the database has a unique source. Partner status reports are generated by those organizations receiving funding from EPA and are maintained by individual EPA Project Officers. As part of their Cooperative Agreement, Consumer Federation of America Foundation provides media tracking of outcomes of all of their public service campaigns and this is publicly available information. The *National Survey on Environmental Management of Asthma* (OMB control number 2060-0490) source is EPA. The medical costs associated with SHS were from *2002 Medical Costs of Childhood Illness Attributable to Environmental Tobacco Smoke: Total National Costs and Cost to Managed Care Organizations*, a report prepared by Abt Associates Inc., an EPA funded contractor. Additional references are the US Surgeon General's report on tobacco (which includes the 1986 seminal document on involuntary smoking and demographic profiles of smoking/ShS exposure in US), the National Cancer Institute's (NCI) *Tobacco Monograph Series* (the sum of current knowledge of clinical trials, clinical guidelines and the validation of EPA and California EPA risk assessments), the NCI funded *Tobacco Use Supplement* portion of the US Census Bureau's *Current Population Survey* (contains fundamental policy questions regarding tobacco/ShS including smoking in the home), and *Healthy People 2010* (which includes information on cotinine, ShS exposure and children).

Other related sources: National Health Interview Survey and National Health and Nutrition Examination Survey are part of the National Center for Health Statistics, Centers for Disease Control and Prevention (http://www.cdc.gov/nchs); Behavioral Risk Factor Surveillance Survey, Centers for Disease Control and Prevention (http://www.cdc.gov/brfss/index.htm).

This information contributes to the knowledge set that helps us to calculate end of year results.

Methods, Assumptions and Suitability: *Partner status reports:* EPA requires all funded organizations to provide status reports on their activities identifying, for example, number of presentations given, pledges signed, number of people trained (i.e. health officials, daycare providers), number of parents reached, and projected number of children no longer exposed as a

result of their activities. EPA believes that the information reflects progress made at achieving performance objectives.

National Survey on Environmental Management of Asthma (OMB control number 2060-0490): This survey is the most robust data set for the FY 2005 performance measure, however it is not administered annually. EPA has designed a survey instrument (telephonic survey) in consultation with staff from EPA's Indoor Environments Division (IED), EPA's Regional offices, and the CDC National Center for Health Statistics (NCHS) to ensure that respondents will understand the questions asked and will provide the type of data necessary to measure the Agency's objectives.

EPA estimates that of the 26,600 households, which make up the sampling frame, 60 percent, or approximately 16,000, will be contacted successfully and will agree to participate in the screening survey. SHS information will be obtained from these individuals. The sample will be large enough to yield the number of responses necessary to achieve an estimated two percent precision rate at a 95 percent confidence level.

Respondents are asked to provide primarily yes/no responses. In some cases, respondents are given a range of responses in the form of multiple choice questions and are asked to indicate the one which best defines their response. By using yes/no and multiple-choice questions, the Agency has substantially reduced the amount of time necessary for the respondent to complete the survey and has ensured consistency in data response and interpretation.
EPA believes that the information collected may be useful in establishing a benchmark, in addition to the1994 and 1998 National Health Interview Survey, for the number of children, ages 6 and under, who are exposed to ShS in the home.

QA/QC Procedures: It is assumed that partner organizations report data as accurately and completely as possible; site-visits are conducted by EPA project officers as warranted. The National Survey was designed in accordance with approved Agency procedures. Additional information is available on the Internet: http://www.epa.gov/icr/players.html.

Data Quality Review: EPA reviews the data from all sources in the performance database to ascertain reliability and resolves any discrepancies.

Data Limitations: The primary limitation associated with Cooperative Agreement Partner status reporting is that self-reporting has an inherent limitation. For the National Survey, random digit dialing methodology is used to ensure that a representative sample of households has been contacted; however, the survey is subject to inherent limitations in voluntary telephone surveys of representative samples. Limitations of phone surveys include: 1) possible inconsistency of interviewers following survey directions. For example, an interviewer might; ask the questions incorrectly or inadvertently lead the interviewee to a response; or 2) call at an inconvenient time. For example, the respondent might not want to be interrupted at the time of the call and may resent the intrusion of the phone call. The answers will reflect this attitude. In addition, a telephone survey is limited to those households with a telephone or households that speak English. Currently available cotinine survey data does not address 50% of the age specific portion of EPA's target population. It does not include birth to three years old, the portion of children most susceptible to the effects of ShS.

Error Estimate: EPA's survey has been designed to ensure that, at the 95 percent confidence level, its estimate of the number of children fewer than 6 not exposed to ShS in the house is within approximately two percentage points of the true value. EPA is confident that these precision rates are more than adequate.

New/Improved Data or Systems: Data from the *National Survey on Environmental Management of Asthma* (OMB control number 2060-0490) was collected from August 4-September 17, 2003 and represents the first data collection with this instrument. This survey utilized the exact questions on SHS from the 1994 and 1998 National Health Interview Survey and will continue to assist in evaluating progress made at achieving our goal. In the future, medical cost data could be collected from a possible expansion of CDC's Smoking Attributable Morbidity and Mortality Economic Costs (SAMMEC) software.

References: EPA Indoor Environments Division (www.epa.gov/iaq/) Survey results will be available in early March 2004. Questions may be directed to the Indoor Environments Division.

National Health Interview Survey and National Health and Nutrition Examination Survey are part of the National Center for Health Statistics, Centers for Disease Control and Prevention (http://www.cdc.gov/nchs)

Behavioral Risk Factor Surveillance Survey, Centers for Disease Control and Prevention (http://www.cdc.gov/brfss/index.htm),

US Surgeon General's report on tobacco (http://www.cdc.gov/tobacco/sgr/index.htm), National Cancer Institute's (NCI) *Tobacco Monograph Series* (http://cancercontrol.cancer.gov/tcrb/monographs/),

NCI funded *Tobacco Use Supplement* portion of the US Census Bureau's *Current Population Survey* (http://riskfactor.cancer.gov/studies/tus-cps/),

Healthy People 2010 (http://www.healthypeople.gov/).

FY 2005 Performance Measure: Students, faculty and staff experiencing improved indoor air quality in their schools

Performance Database: The performance database consists of cooperative partner status reports, annual results reports from the regions, and tracking numbers of disseminated kits. A survey of a representative sample of schools was completed during 2002. The survey serves to verify the number of schools using indoor air quality management plans consistent with EPA's guidance.

Data Source: The sources for the database include cooperative partners, regional data, information from EPA's National Clearinghouse on numbers of kits disseminated, and the statistical sample of all public and private schools in the nation during the 1999 – 2000 school year. (United States Department of Education National Center for Education Statistics).

Methods, Assumptions and Suitability: Calculations for the number of people experiencing improved IAQ are based upon an estimated average of 525 students, staff and faculty per school (data are from the United States Department of Education National Center for Education Statistics). Estimates of the number of schools implementing IAQ management plans, consistent with EPA's guidance, are conservative, and based upon a small percentage of the number of kits distributed, and the number of schools implementing IAQ management plans reported by cooperative partners and regions. A total of 809 completed questionnaires were returned for a survey response rate of 40%. There was no evidence of systematic error or selection bias associated with the response rate. The survey helped determine the number of schools adopting and implementing good indoor air quality (IAQ) practices consistent with EPA's IAQ Tools for Schools (TfS) guidance.

The distribution of returned and targeted questionnaires was similar with respect to the stratification criteria of geographic region and public/private schools. Academic resource, demographic, and socioeconomic characteristics of schools that returned the survey were approximately equal to those of schools that did not return the questionnaire. IAQ management practices were independent of the amount of follow-up effort required to elicit return of a questionnaire. These findings indicate that the EPA can use the survey results to make national projections regarding IAQ practices in schools.

Survey results were evaluated against the IAQ Practice Index, a scoring system developed by weighting possible responses to questions regarding Integrated Pest Management (IPM) practices and ventilation rates. An IAQ Practice Index score of $\geq$70 was considered indicative of an adequate IAQ management plan.

QA/QC Procedures: A small sample of returned questionnaires was selected at random and the manual data transcription from the original paper copy to the electronic database was reviewed for completeness and accuracy. A total of 3,670 entries were cross-referenced between the database and the paper copy of the survey. A few minor typographical errors in results from the first page of the questionnaire were identified (e.g., a period missing in P.O. Box or letters inverted in a name). Otherwise, all responses to the actual survey questions were accurately entered into the database.

As a quality control procedure, a random sample of surveys was scored manually and the IAQ Management Practice Index was computed by hand. The scores and indices were compared to the corresponding values generated by the computerized scoring program. In total, 140 data points were checked. The results of all the surveys that were hand-scored matched the values from the computerized scoring. In addition, the *IAQ Practices in Schools Survey Analysis* procedures and report underwent technical review by a qualified party at Environmental Health and Engineering, Inc. (EH&E), EPA's contractor, not involved in the original analysis. Survey is designed in accordance with approved Agency procedures. Additional information is available on the Internet: http://www.epa.gov/icr/players.html

Data Quality Review: Entries were cross-referenced between the database and the paper copy of the survey to ensure completeness and quality of responses. See QA/QC procedures, above.

Data Limitations: The primary limitation associated with Cooperative Agreement Partner status reporting is that self-reporting has an inherent limitation. For the National Survey, random digit

dialing methodology is used to ensure that a representative sample of households has been contacted; however, the survey is subject to inherent limitations in voluntary telephone surveys of representative samples. Limitations of phone surveys include: 1) possible inconsistency of interviewers following survey directions. For example, an interviewer might; ask the questions incorrectly or inadvertently lead the interviewee to a response; or 2) call at an inconvenient time. For example, the respondent might not want to be interrupted at the time of the call and may resent the intrusion of the phone call. The answers will reflect this attitude. In addition, a telephone survey is limited to those households with a telephone or households that speak English.

Error Estimate: The sample size was selected to ensure that the survey response yields a statistically valid result with a +/- three percent margin of error at the 95th percent confidence level.

New/Improved Data or Systems: Prior to the survey, EPA tracked the number of schools receiving the Tools for Schools (TfS) guidance and estimated the population of the school to determine the number of students/staff experiencing improved indoor air quality. With this survey, EPA queried a statistically representative sample of schools, to estimate the number of schools that have actually adopted and implemented good IAQ management practices consistent with the TfS guidance.

References: See the United States Department of Education National Center for Education Statistics,http://nces.ed.gov/. See also Indoor Air Quality Tools for Schools Kit (402-K-95-001) at http://www.epa.gov/iaq/schools. There is no website specifically relating to the survey. Inquiries may be made directly to the EPA Office of Indoor Environments.

FY 2005 Performance Measure: Office Workers improved indoor air quality in their workplaces.

Performance Database: The performance database consists of two sources, requested copies of building indoor air quality guidance documents, (e.g. Building Air Quality, I-Beam, and related guidance Mold Remediation in Schools and Commercial Buildings) and training conducted through cooperative agreements or other government agencies (e.g., General Services Administration (GSA)) using EPA's documents. In addition, EPA conducted a voluntary, pilot survey of building owners and managers in 2001 to determine the use of indoor air quality (IAQ) management practices in U.S. office buildings.

Data Source: The survey was developed by EPA and distributed by Building Owners and Managers Association (BOMA). The survey's purpose and design received approval from the Office of Management and Budget. The survey is not administered on an annual basis.

Methods, Assumptions and Suitability: EPA developed a seven-page survey of multiple-choice questions that requested each building owner or manager to supply information regarding: the size and uses of a selected building; documentation of management practices employed in the building; how the heating, ventilating, and air-conditioning systems are managed; how pollution sources are addressed; housekeeping and pest management practices; remodeling and renovation activities; and responses to tenant complaints regarding IAQ. EPA's contractor developed a

project database to facilitate entry, storage and reporting statistics obtained from the survey. Based upon random sampling of membership lists from BOMA, the International Facilities Managers Association (IFMA) and buildings managed by the General Services Administration (GSA), the contractor generated a sampling frame. The final sample size, (and survey recipient list) was 3,612 and we received 591 completed surveys. The survey results identified both strengths and weaknesses in building management practices in U.S. office buildings.

QA/QC Procedures: The survey was focus group tested and peer-reviewed by IAQ professionals to ensure that respondents would understand the questions and provide accurate responses. It was also designed by a statistician to ensure reliability of the data collected. Each survey mailed was assigned a unique identifier to facilitate the tracking of survey responses within the database. BOMA, EPA's cooperative partner, ensured accuracy and completeness of submitted surveys by reviewing each submission prior to data entry. A double-entry protocol for all data entry was implemented to ensure an accuracy rate of at least 99%; each survey form was entered into the database twice, after which a computer program identified any variances. Two-percent of the records were randomly checked to ensure that accuracy goals were met. BOMA was responsible for tracking survey responses, entering the survey responses into the database, maintaining the data in a secure environment and providing quality assurance/quality control of all survey activities.

After the quality assurance checks on the data were performed, EPA's contractor aggregated the data analyses. EPA and the contractor developed a method to score the responses for each item on the questionnaire and computed an index of IAQ management practices. The quality of the scoring program results was assured by random inspection and correction, if necessary. The IAQ indices were analyzed using analysis-of-variance techniques to identify covariates of IAQ practices that could be used in considering future program initiatives.

Data Quality Review: BOMA had responsibility for the accuracy of data entered into the database. Quality assurance safeguards were used in the data entry. BOMA, and EPA's contractor reviewed individual survey responses and data for accuracy during the aggregation and analyses activities.

Data Limitations: The primary limitation associated with basing estimates on requests for guidance documents and training is the unknown factor of how many of the requests result in actions resulting in improved indoor air quality. The survey provides a reference point on progress. The survey results are subject to the limitations inherent in survey sampling. The response rate of 14% for the survey was low due to the timing of the survey administration and subsequent events in September and October 2001.

Error Estimate: 4% precision at a 95% confidence level.

New/Improved Data or Systems: None

References: There is no website specifically relating to this survey. Inquiries may be made directly to EPA's Office of Air and Radiation, Indoor Environments Division.

COORDINATION WITH OTHER AGENCIES

EPA works closely through a variety of mechanisms with a broad range of Federal, state, Tribal, and local government agencies, industry, non-profit organizations, individuals as well as other nations to promote more effective approaches to identifying and solving indoor air quality problems. At the Federal level, EPA works closely with:

- The Department of Health and Human Services (DHHS) to develop and conduction programs aimed at reducing children's exposure to known indoor triggers of asthma, including secondhand smoke;
- Department of Housing and Urban Development (HUD) on home health and safety issues, especially those affecting children;
- Consumer Product Safety Commission (CPSC) to identify and mitigate the health hazards of consumer products designed for indoor use;
- Department of Education (DoEd) to encourage construction of schools with good indoor air quality; and
- Department of Agriculture (USDA) to encourage USDA Extension Agents to conduct local projects designed to reduce risks from indoor air quality.

EPA plays a leadership role on the President's Task Force on Environmental Health Risks and Safety Risks to Children, particularly with respect to asthma and school environmental health issues.

As Co-chair of the interagency Committee on Indoor Air Quality (CIAQ), EPA works with the CPSC, the Department of Energy, the National Institute for Occupational Safety and Health, and the Occupational Safety and Health Administration to review EPA draft publications, arrange the distribution of EPA publications, and coordinate the efforts of Federal agencies with those of state and local agencies concerned with indoor air issues.

STATUTORY AUTHORITIES

Clean Air Act Amendments of 1990 (CAA)
Indoor Radon Abatement Act (IRAA), Section 306
Radon Gas and Indoor Air Quality Research Act of Title IV of the Superfund Amendments and Re-authorization Act (SARA) of 1986
Toxic Substances Control Act (TSCA), section 6, Titles II, and Title III (15 U.S.C. 2605 and 2641-2671), and Section 10

OBJECTIVE: Protect the Ozone Layer

By 2010, through worldwide action, ozone concentrations in the stratosphere will have stopped declining and slowly begun the slow process of recovery, and the risk to human health from overexposure to ultraviolet (UV) radiation, particularly among susceptible subpopulations, such as children, will be reduced.

Resource Summary
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Protect the Ozone Layer	**$18,145.2**	**$19,069.4**	**$21,813.7**	**$2,744.3**
Environmental Program & Management	$17,892.5	$18,802.0	$21,516.2	$2,714.2
Buildings & Facilities	$164.4	$152.8	$164.7	$11.9
Inspector General	$88.3	$114.6	$132.8	$18.2
Total Workyears	39.2	36.1	36.7	0.6

Program Project
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Stratospheric Ozone: Domestic Programs	$5,994.8	$5,786.6	$5,839.6	$53.0
Stratospheric Ozone: Multilateral Fund	$9,518.9	$11,000.0	$13,500.0	$2,500.0
Administrative Projects	$2,631.5	$2,282.8	$2,474.1	$191.3
TOTAL	**$18,145.2**	**$19,069.4**	**$21,813.7**	**$2,744.3**

FY 2005 REQUEST

The stratospheric ozone layer protects life on earth by preventing harmful UV radiation from reaching the earth's surface. Scientific evidence amassed over the past 25 years has shown that chlorofluorocarbons (CFCs), halons, hydrochlorofluorocarbons (HCFCs), methyl bromide, and other halogenated chemicals used around the world are destroying the stratospheric ozone layer.[78] Increased levels of UV radiation due to ozone depletion may lead to a greater chance of overexposure to UV radiation and consequent health effects such as skin cancer, cataracts, and

[78] World Meteorological Organization (WMO). "Scientific Assessment of Ozone Depletion: 2002." WMO: Geneva, Switzerland. February 2003.

other illnesses.[79] Skin cancer is the most common type of cancer and may account for more than 50 percent of all cancers in adults.[80] Increased UV levels have also been associated with other human and non-human endpoints, including immune suppression and effects on aquatic ecosystems and agricultural crops. However, additional research is necessary to quantify and model these effects.

Results to be Achieved under this Objective

EPA will achieve this objective in FY 2005 through implementation of significant goals in the domestic and international phase-out of ozone depleting substances (ODSs). EPA estimates that, in the United States alone, the worldwide phase-out of ODSs will save 6.3 million lives from fatal cases of skin cancer, and will avoid 299 million cases of non-fatal skin cancers and 27.5 million cases of cataracts between 1990 and 2165.[81] This estimate is based on the assumption that international ODS phase-out targets will be achieved, which will allow the ozone layer to begin recovering by the middle of this century. According to current atmospheric research, the ozone layer is not expected to recover until the mid-21st century at the earliest, due to the very long lifetimes of ODSs.[82] Given that ozone recovery will take several decades, EPA will continue education and outreach efforts to encourage behavioral changes that reduce UV-related health risks.

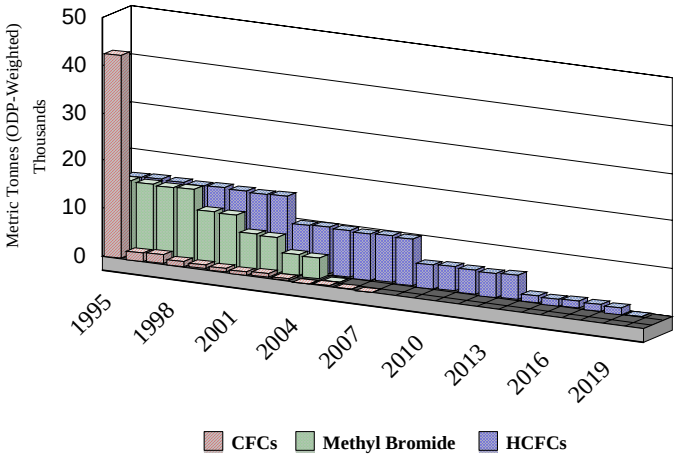
Stratospheric Ozone: Domestic Programs

EPA will implement the provisions of the Clean Air Act Amendments of 1990 (the Act) and the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol), which will lead to the reduction and control of ODSs in the U.S. and lower health risks to the American public due to exposure to UV radiation. The Act provides for a phase-out of production and consumption of ozone-depleting chemicals, and requires controls on various products containing ODSs. As a signatory to the Montreal Protocol, the U.S. also is committed to regulating and enforcing its terms domestically. In carrying out the requirements of the Act and the Montreal Protocol, EPA will continue to implement the domestic rulemaking agenda for reduction and control of ODSs and will enforce rules controlling their production, import, and emissions. EPA's program will combine market-based regulatory approaches with sector-specific technology guidelines and will facilitate the development and commercialization of alternatives to methyl bromide and HCFCs.

[79] World Health Organization. "Solar Radiation and Human Health: Fact Sheet No. 227." August 1999. Accessed Decenber 30, 2003. Available on the Internet at: www.who.int/inf-fs/en/fact227.html.
[80] American Cancer Society. "What are the Key Statistics for Melanoma?" Accessed December 30, 2003. Available on the Internet at: www.cancer.org/docroot/CRI/CRI_0.asp.
[81] U.S. Environmental Protection Agency (EPA). The Benefits and Costs of the Clean Air Act 1990-2010: EPA Report to Congress. EPA: Washington, DC. November 1999.
[82] WMO, February 2003.

Pollution prevention is an important element in achieving the ozone protection objective. The National Emission Reduction Program will require recovery and recycling or reclamation of ODSs, primarily in the air-conditioning and refrigeration sectors. Also, under the Significant New Alternatives Policy (SNAP), EPA will review newly developed alternatives to ODSs and, if necessary, will restrict use of alternatives for a given application that are more harmful to human health and the environment on an overall basis. In addition, EPA will join with other Federal agencies to facilitate the transition away from remaining uses of ODSs such as methyl bromide and HCFCs, and will work with Federal and international agencies to curb illegal imports of ODSs.

U.S. Significant Goals in Controlling Ozone-Depleting Substances



Given that Americans will be exposed to higher levels of UV radiation even after program goals have been met, EPA will undertake efforts to inform the public about health risks associated with UV radiation exposure and encourage sun safety behaviors that help to reduce risk. The Agency is placing special emphasis on education and outreach to children, who are particularly vulnerable to UV overexposure, through the SunWise School Program.

Accomplishments of the Domestic Stratospheric Ozone Protection Program include:

- Implementation of the phase-out of the following Class I chemicals: CFCs, halons, methyl chloroform, carbon tetrachloride, chlorobromomethane, and hydrobromofluorocarbons (HBFCs).

- In FY 2002 and FY 2003, development of a marketable allowance allocation program to ensure graduated phaseout of HCFCs, leading to full phaseout by 2030, in compliance with the Montreal Protocol. In FY 2003, EPA implemented the phase-out of HCFC-141b.

Implementation of a graduated phase-out of methyl bromide, employing marketable allowances and also allowing for quarantine, pre-shipment, emergency and critical uses. In FY 2002, EPA reduced methyl bromide production and import by 50 percent from the 1991 baseline. In FY 2002, EPA collaborated with the U.S. Department of Agriculture (USDA) and the Department of State, among other Federal agencies, to receive, analyze, compile and submit the first U.S. nomination for critical use exemptions from the 2005 methyl bromide phase-out. In FY 2003, EPA reduced methyl bromide production and import by 70 percent from the 1991 baseline. Simultaneously, EPA collaborated with the USDA and industry to test and register alternatives to methyl bromide. To date, EPA has registered sufuryl fluoride, a significant

methyl bromide alternative for stored fruits, nuts, and grains, and estimates that up to 20% of nut crops, 40% of dried fruit and 2% of stored grains will transition to this newly available chemical. In addition, EPA has registered some herbicides that may be effective alternatives to methyl bromide when used in combination with 1,3-dichloropropene, a widely used fumigant. Combination alternatives to methyl bromide are particularly of use in the southeastern U.S., where heavy wind pressures render some alternatives ineffective. EPA registered halosulfuron-methyl, an herbicide that may be used on tomatoes, eggplants, peppers, and cucurbits, in 2002 and also recently registered trifloxysulfuron, an herbicide for use on tomatoes.

- Monitoring, interception, and prosecution of illegal imports of ODSs, through collaboration with the Department of Justice and the Department of Homeland Security.
- Implementation of an essential use allowance program for production and importation of CFCs and other ODSs needed for vital applications, particularly metered-dose inhalers for asthma and other respiratory illnesses. An estimated 20 million patients had asthma in 2001; most of these patients rely on metered-dose inhalers for treatment.[83] Medical consensus is that primary treatment of asthma and COPD should be by the inhaled route, and MDIs are the dominant inhaled delivery system for all categories of drugs.
- Continued recovery and recycling of ODSs and alternatives in the U.S. and abroad.
- Regulatory review and outreach under the SNAP to ensure that substitutes for ozone-depleting chemicals used across major industry and consumer sectors are safer for public health and the environment than the ODSs they replace. During FY 2002 and FY 2003, EPA listed 30 additional possible alternatives to ODSs as acceptable for use in refrigeration and air-conditioning, solvent cleaning, aerosols, insulating foams, fire protection, adhesives, coatings and inks, bringing the combined total of acceptable substitutes to approximately 410 since 1994. EPA also restricted the use of several proposed substitutes to prevent unacceptable risks to the environment, consumers, and worker health and safety.
- Implementation of the SunWise School Program, with the goal of reducing the health risks to children and their caregivers from overexposure to UV radiation. During the 2002-2003 school year, the SunWise program grew from 3,750 to 7,277 participating schools in 50 states, Puerto Rico, and the District of Columbia. SunWise also broadened its reach as seven science museums incorporated SunWise into their programming.

Stratospheric Ozone: Multilateral Fund

Under the Montreal Protocol, the U.S. and other developed countries contribute to the Multilateral Fund to support projects and activities that eliminate the production and use of ODSs by developing countries. As of June 2, 2003, the United States and 184 other countries are Parties to the Montreal Protocol. The United States has repeatedly affirmed its commitment to this international treaty and to demonstrating world leadership by phasing out domestic production of ODSs, as well as helping other countries find suitable alternatives. Because the Protocol makes developing country compliance contingent on support from the Multilateral

[83] American Lung Association. "Trends in Asthma Morbidity and Mortality." ALA: New York, NY. March 2003.

Fund, continued support for the Fund is critical if we are to ensure restoration and protection of the ozone layer.

Accomplishments of the Multilateral Fund include:

- To date, the fund has supported over 4,480 activities in 134 countries that, when fully implemented, will prevent annual emissions of more than 174,000 metric tons of ODSs. Approximately 60% of projects have been implemented to date, and the remaining projects are expected to be implemented by 2008.

- In addition, the fund has reached long-term agreements to dismantle over two-thirds of developing country CFC production capacity and virtually all of developing country halon production capacity. Final closure of related facilities depends on continued funding.

- EPA's FY 2003 contribution to the Multilateral Fund helped the fund support cost-effective projects designed to build capacity and eliminate ODS production and consumption in over 60 developing countries. OK

FY 2005 CHANGE FROM FY 2004

EPM

- (+2,500,000): This increase assists the U.S. in meeting its funding commitment to the Montreal Protocol Multilateral Fund.

- There are additional increases for payroll, cost of living, and enrichment for existing FTE.

ANNUAL PERFORMANCE GOALS AND MEASURES

Restrict Domestic Consumption of Class II HCFCs

In 2005 Restrict domestic consumption of class II HCFCs below 9,906 ODP-weighted metric tonnes (ODP MTs) and restrict domestic exempted production and import of newly produced class I CFCs and halons below 10,000 ODP MTs.

In 2004 Restrict domestic consumption of class II HCFCs below 9,906 ODP-weighted metric tonnes (ODP MTs) and restrict domestic exempted production and import of newly produced class I CFCs and halons below 10,000 ODP MTs.

In 2003 End of year FY 2003 data will be available in late 2004 to verify restriction of domestic consumption of class II HCFCs below 9,906 ODP-weighted metric tonnes (ODP MTs) and restriction of domestic exempted production and import of newly produced class I CFCs and halons below 10,000 ODP MTs.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Domestic Consumption of Class II HCFCs	Data Lag	<9,906	<9,906	ODP MTs
Domestic Exempted Production and Import of Newly Produced Class I CFC s and Halons	Data Lag	<10,000	<10,000	ODP MTs

Baseline: The base of comparison for assessing progress on the 2005 annual performance goal is the domestic consumption cap of class II HCFCs as set by the Parties to the Montreal Protocol. Each Ozone Depleting Substance (ODS) is weighted based on the damage it does to the stratospheric ozone - this is its ozone-depletion potential (ODP). Beginning on January 1, 1996, the cap was set at the sum of 2.8 percent of the domestic ODP-weighted consumption of CFCs in 1989 plus the ODP-weighted level of HCFCs in 1989. Consumption equals production plus import minus export.

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Performance Measure: Restrict Domestic Consumption of Class II HCFCs Restrict Domestic Exempted Production and Import of Newly Produced Class I CFCs and Halons

Performance Database: The Allowance Tracking System (ATS) database is maintained by the Global Programs Division (GPD). ATS is used to compile and analyze quarterly information on U.S. production, imports, exports, transformations, and allowance trades of ozone-depleting substances (ODS).

Data Source: Progress on restricting domestic exempted consumption of Class I CFCs and halons is tracked by monitoring industry reports of compliance with EPA's phaseout regulations. Data are provided by U.S. companies producing, importing, and exporting ODS. Monthly information on domestic production, imports, and exports from the International Trade Commission is maintained in the ATS. Corporate data are typically submitted as quarterly reports. Specific requirements as outlined in the Clean Air Act are available on the Internet at: http://www.epa.gov/oar/caa/caa603.txt

Methods, Assumptions and Suitability: Data are aggregated across all U.S. companies for each individual ODS to analyze U.S. total consumption and production.

QA/QC Procedures: Reporting and record-keeping requirements are published in 40 CFR Part 82, Subpart A, Sections 82.9 through 82.13. These sections of the Stratospheric Ozone Protection Rule specify the required data and accompanying documentation that companies must submit or maintain on-site to demonstrate their compliance with the regulation.

The ATS data are subject to a Quality Assurance Plan. In addition, the data are subject to an annual quality assurance review, coordinated by OAR staff separate from those on the team normally responsible for data collection and maintenance. The ATS is programmed to ensure consistency of the data elements reported by companies. The tracking system flags inconsistent data for review and resolution by the tracking system manager. This information is then cross-

checked with compliance data submitted by reporting companies. The GPD maintains a user's manual for the ATS that specifies the standard operating procedures for data entry and data analysis. Regional inspectors perform inspections and audits on-site at the facilities of producers, importers, and exporters. These audits verify the accuracy of compliance data submitted to EPA through examination of company records.

Data Quality Reviews: The Government Accounting Office (GAO) completed a review of U.S. participation in five international environmental agreements, and analyzed data submissions from the U.S. under the Montreal Protocol on Substances the Deplete the Ozone Layer. No deficiencies were identified in their January 2003 report.

Data Limitations: None. Data are required by the Clean Air Act.

Error Estimate: None

New/Improved Data or Systems: The GPD continues to explore an improved system whereby direct electronic reporting would be possible.

References: See http://www.epa.gov/ozone/desc.html for additional information on ODSs. See http://www.unep.ch/ozone/montreal.shtml for additional information about the Montreal Protocol. See http://www.unmfs.org/ for more information about the Multilateral Fund.

EFFICIENCY MEASURES/MEASUREMENT DEVELOPMENT PLANS

EPA continues to place a great emphasis on improving its performance measures. In addition to and complementing the Agency's outcome-based environmental performance measures, some programs are developing efficiency measures. Efficiency measures are structured as a ratio of key program inputs (e.g. time, dollars, FTE) to program outputs or outcomes. They are intended to provide EPA programs with additional information that can be used for sound decision-making and program management.

Below are EPA's proposed efficiency measures for selected programs.

Stratospheric Ozone: For every $50 invested by EPA in the domestic ODS phaseout program and the Multilateral Fund, the US will avoid 1 skin cancer fatality related to UV radiation exposure. This outcome assumes that the US and other Parties to the Montreal Protocol achieve planned phaseout targets, and that present funding levels are continued.

COORDINATION WITH OTHER AGENCIES

In an effort to curb the illegal importation of ODSs, an interagency task force was formed consisting of representatives from EPA, the Departments of Justice, Homeland Security, State, and Commerce, and the Internal Revenue Service. Venting of illegally imported chemicals has the potential to prevent the United States from meeting the goals of the Montreal Protocol to restore the ozone layer.

EPA works very closely with the Department of State and other Federal agencies, as appropriate, in international negotiations among Parties to the Protocol. EPA works with the Office of the United States Trade Representative to analyze potential trade implications in stratospheric protection regulations that affect imports and exports.

EPA is working with the USDA and the Department of State to facilitate research and development of alternatives to methyl bromide. EPA collaborates with USDA and the Department of State to prepare U.S. requests for emergency and critical use exemptions of methyl bromide. EPA is providing input to USDA on rulemakings for methyl bromide-related programs. EPA consults with the Food and Drug Administration (FDA) on the potential for domestic methyl bromide needs.

EPA also coordinates closely with FDA to ensure that sufficient supplies of CFCs are available for the production of life-saving metered-dose inhalers for the treatment of asthma and other lung diseases. This partnership between EPA and FDA combines the critical goals of protecting public health and limiting damage to the stratospheric ozone layer.

EPA works with the Centers for Disease Control and the National Weather Service to coordinate the UV Index and the health messages that accompany index reports. EPA is a member of the Federal Council on Skin Cancer Prevention, which educates and protects all Federal employees from the risks of overexposure to UV radiation.

In addition to collecting its own UV data, EPA coordinates with the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration to monitor the state of the stratospheric ozone layer. EPA also works with NASA on assessing essential uses and other exemptions for critical shuttle and rocket needs, as well as effects of direct emissions of high-speed aircraft flying in the stratosphere.

EPA coordinates with the Small Business Administration to ensure that proposed rules are developed in accordance with the Small Business Regulatory Flexibility Act.

STATUTORY AUTHORITIES

Clean Air Act Amendments of 1990 (CAA), Title I, Parts A and D (42U.S.C. 7401-7434, 7501 7515), Title V (42 U.S.C. 7661-7661f), and Title VI (42 U.S.C. 7671-7671q)
Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109)
Resource Conservation and Recovery Act (42 U.S.C. 6921-6926 and 6938) sections 3001-3006 and 3017
The Montreal Protocol on Substances that Deplete the Ozone Layer

Environmental Protection Agency

FY 2005 Annual Performance Plan and Congressional Justification

Clean Air and Global Climate Change

OBJECTIVE: Radiation

Through 2008, working with partners, EPA will minimize unnecessary releases of radiation and be prepared to minimize impacts to human health and the environment should unwanted releases occur.

Resource Summary
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Radiation	**$30,046.8**	**$34,858.9**	**$34,718.0**	**($141.0)**
Environmental Program & Management	$19,881.9	$21,060.8	$20,914.1	($146.7)
Hazardous Substance Superfund	$3,058.4	$3,027.2	$3,207.1	$179.8
Science & Technology	$6,284.3	$9,797.7	$9,574.9	($222.8)
Building & Facilities	$715.4	$817.4	$868.7	$51.3
Inspector General	$106.6	$155.8	$153.2	(-$2.6)
Total Workyears	168.1	185.0	183.9	-1.2

Program Project
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Radiation: Protection	$15,743.2	$17,392.7	$15,620.4	($1,772.3)
Radiation: Response Preparedness	$4,128.8	$4,081.2	$4,849.9	$768.7
Homeland Security: Preparedness, Response, and Recovery	$998.3	$3,703.6	$4,144.3	$440.7
Administrative Projects	$9,176.5	$9,681.4	$10,103.4	$421.9
TOTAL	**$30,046.8**	**$34,858.9**	**$34,718.0**	**($141.0)**

FY 2005 REQUEST

EPA will continue to meet the statutory requirements for management of radioactive wastes and control of radioactive emissions. The Agency also will fulfill its responsibilities under Presidential Decision Directives for radiological emergency preparedness and response.[84]

[1] Information about authorizing and relevant laws, presidential decision directives, executive orders , federal plans, and regulations related to EPA's radiation program can be accessed at: http://www.epa.gov/radiation/laws/

These responsibilities form the core of our strategy to protect the public and the environment from unnecessary exposure to radiation.[85] EPA also is positioned to anticipate emerging issues and identify non-traditional mechanisms of exposure to the public and the environment.

EPA works with other Federal agencies, states, Tribes, and industry to develop innovative ways to minimize radiation exposures through training, public information, and voluntary programs.

Results to be Achieved under this Objective

EPA helps prevent public exposure to harmful levels of radiation in the environment by working with other Federal, state, Tribal, and local agencies to assess exposure risks, manage radioactive releases and exposures, ensure proper disposal of radioactive materials, and provide the public with information about radiation and its hazards.[86] Should an event occur, EPA maintains a high level of preparedness to respond to radiological emergencies.

Radiation: Protection

To help protect Americans from exposure to harmful levels of radiation in the environment, EPA is charged with responsibility for a number of activities. One of EPA's major radiation-related responsibilities is to certify that all radioactive waste shipped by the Department of Energy (DOE) to the Waste Isolation Pilot Plant (WIPP) is permanently and safely disposed of, consistent with EPA standards.[87] EPA conducts inspections of waste generator facilities and biennially evaluates DOE's compliance with applicable environmental laws and regulations. Every five years EPA must re-certify that the WIPP will comply with EPA's radioactive waste disposal regulations.

Mining and processing of naturally-occurring radioactive materials for use in medicine, power generation, consumer products, and industry generates emissions and waste. EPA protects people and the environment from harmful and avoidable exposure to radiation by assessing exposure risks and providing information about radiation and its hazards. EPA is the lead Federal agency for responding to international emergencies involving radioactive materials. EPA also provides guidance and training to other Federal and state agencies in preparing for emergencies at U.S. nuclear plants, for transportation accidents involving shipments of radioactive materials, and for acts of nuclear terrorism. EPA sets protective limits on radioactive emissions for all media—air, water, and soil—and develops guidance for cleaning up radioactively-contaminated Superfund sites.

We will ensure that the Agency has appropriate methods to manage radioactive releases and exposures. Approaches to meet this objective will include health risk site assessments, risk modeling, clean-up, and waste management activities; voluntary programs to minimize exposure to radiation in commercial products and industrial applications, national radiation monitoring, and radiological emergency response; and provision of Federal guidance to our international, Federal, state, and local partners.

[85] Additional information can be accessed at: http://www.epa.gov/radiation/
[86] Additional information can be accessed at: http://www.epa.gov/radiation/assessment/
[87] Additional information can be accessed at: http://www.epa.gov/radiation/WIPP/

EPA will continue working with other Federal agencies such as the Nuclear Regulatory Commission (NRC), DOE, the Border and Transportation Security directorate of the Department of Homeland Security (DHS), and the Department of State, as well as with state agencies and international organizations to prevent metals and finished products suspected of having radioactive contamination from entering the country. EPA also will create partnerships with states, local agencies, and Tribes to locate and secure lost, stolen, or abandoned radioactive sources within the U.S. and develop voluntary programs with state and local agencies and industry to investigate and promote pollution prevention, operational practices, and technologies to reduce industrial releases of radioactivity.

EPA will continue to evaluate human health and environmental risks from radiation exposure. EPA is implementing its strategy to address Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) by developing and compiling sector-specific technical information, by interacting with Regional offices and Tribal governments on educational and clean-up efforts, and by exploring ways to partner with governmental and non-governmental interests.[88]

In FY 2005, EPA will provide national-level guidance on the risks posed by radioactive materials in the environment, including technical guidance for conducting risk assessments. EPA will accomplish this by working with the public, industry, states, Tribes and other governmental agencies to inform and educate people about radiation risks and promote actions that reduce human exposure. EPA, in partnership with other Federal agencies, will promote the management of radiation risks in a consistent and safe manner at Superfund, DOE, Department of Defense (DOD), state, local and other Federal sites by:

- Evaluating human health and environmental risks from radiation site exposure, developing models of the environmental fate and transport of radionuclides, and providing a basic understanding of the biological effects of radiation.
- Developing risk assessments, remediation technologies, and measurement and information systems.
- Providing training and direct site assistance including laboratory, field, and risk assessment support at sites with actual or suspected radioactive contamination.

The radiation program also maintains an on-going capability to provide radioanalytical and mixed waste analytical data on environmental samples to support site assessment, clean-up, and response activities. Finally, EPA coordinates with other nations on select radiological issues, including risk assessment methodologies and risk management approaches.

Radiation: Response Preparedness

To help protect Americans from unexpected radiological events, EPA is charged with maintaining a high level of preparedness to respond to radiological emergencies. In FY 2005, EPA's Radiological Emergency Response Team (RERT), a component of the Agency's emergency response structure, will continue to prepare for incidents for which EPA is the Lead Federal Agency under the Federal Radiological Emergency Response Plan, as well as prepare to

[88] Additional information can be accessed at: http://www.epa.gov/radiation/tenorm/about.htm

support other Lead Federal Agencies, as appropriate. EPA will coordinate with its interagency partners to revise Federal radiation emergency response plans, develop radiological emergency response standard operating procedures and guidance for coordination of Agency support to other Federal and state response agencies, and conduct training and exercises to enhance the ability of the RERT to fulfill its responsibilities in response actions.[89]

EPA will conduct exercises and training along with planning and participating in international, Federal, and field exercises including anti-terrorism activities with the NRC, DOE, and DOD. We will train state, local and Federal officials and provide technical support to state radiation, solid waste, and health programs that participate in Radiological Emergency Response. We also will maintain and update Protective Action Guides (PAGs) for use by Federal, state and local officials and provide training on the use of the PAGs. This includes conducting Protective Action Guide workshops and radiological emergency response exercises.[90]

We will provide policy development and on-site technical support, and asset management, and plan intra-Agency coordination and field exercises for EPA's counter-terrorism program. We also will provide information to the public on EPA Emergency Response activities and capabilities. We will continue to provide scientific data and analysis on radiation emergency response programs across the Agency. We will maintain readiness for radiological emergency responses, which includes participation in mock emergency response situations.

Homeland Security: Preparedness Response and Recovery

Under the National Strategy for Homeland Security and Federal response plans, EPA has specific response and recovery responsibilities. The Agency will continue to strengthen its response capabilities, clarify its roles and responsibilities to ensure an effective response, and promote improved response capabilities across government and industry in areas where EPA has unique knowledge and expertise.

EPA's Environmental Radiation Ambient Monitoring System (ERAMS) is the only nationwide environmental radiation monitoring program that provides information about the wide-scale spread of radioactive material from nuclear or radiological incidents.[91] ERAMS includes a network of sampling stations throughout the United States that routinely monitors air, water (precipitation and drinking water), and milk for radioactive contamination. Data from ERAMS provide timely information for making protective action decisions in the event of a major nuclear or radiological event.

ERAMS has operated for over 30 years with an average of one sampling site for each type of media (air, precipitation, drinking water and milk) per state resulting in air monitoring coverage for approximately 24 percent of the population. The current response time for results is measured in days, allowing time for collection of samples, shipment to the laboratory, and performance of analyses.

Planned upgrades to the National Monitoring System in FY 2005 will improve our response time and data dissemination from days to hours. These upgrades will provide the

[89] Additional information can be accessed at: http://www.epa.gov/radiation/rert/rert.htm
[90] Additional information can be accessed at: http://www.epa.gov/radiation/rert/pags.htm
[91] Additional information can be accessed at: http://www.epa.gov/narel/erams/

Agency with greater access to near real-time data, enabling officials to make rapid decisions about protecting public health, thereby improving preparedness for radiological incidents. When fully implemented in FY 2009, ERAMS will have 180 fixed air monitoring stations increasing U.S. population coverage from 24 percent to 70 percent. Planned improvements to the monitoring system during FY 2005 include:

- Production and development of 60 air samplers with real-time gamma spectrometric monitoring capability
- A contract to deploy and maintain ambient air radiation samplers
- Agreements with site operators
- Testing of 40 deployable monitoring systems at remote sites

The monitoring system is supported by an electronic database and telemetry system that gathers data from the National Monitoring System, RERT, and other sources. In FY 2005, the database will be tested for the ability to review data, perform dose/risk calculations, and transmit the results in a secure mode. Once testing is complete, the database will come online.

FY 2005 CHANGE FROM FY 2004

EPM

- (+ $209,900): This increase represents a redirection of resources from Radiation: Protection to Radiation: Response Preparedness. This increase will allow us to work with local emergency responders to ensure that they can respond to emergencies involving radiation.

- (- $521,100): This decrease represents a redirection of resources from Radiation Protection to Radiation: Response Preparedness. Two workyears have also been redirected to Goal 1, Objective 2.

S&T

- (+ $558,800, +9.0 FTE): This increase to Radiation: Preparedness represents a redirection of resources and workyears from Radiation: Protection in order to better fund emergency preparedness and response activities. We will work with communities and local responders to ensure that the adequate lab protocols are followed in situations involving radiation.

- (+ $440,700, +4.1 FTE): This increase represents a redirection from Radiation: Protection to expand and upgrade the existing radiation monitoring system (ERAMS). With additional resources we will continue to expand the ERAMS network to cover more areas as well as upgrade the data system supporting it.

- (- $1,237,900, -13.1 FTE): This decrease represents a redirection in resources and workyears from Radiation: Protection to higher priority work in two other Radiation objective areas: (1) Radiation: Preparedness; (2) Homeland Security: Preparedness, Response, and Recovery.

ANNUAL PERFORMANCE GOALS AND MEASURES

Ensure WIPP Safety

In 2005 Certify that 40,000 55-gallon drums of radioactive waste (containing approximately 120,000 curies) shipped by DOE to the Waste Isolation Pilot Plant are permanently disposed of safely and according to EPA standards.

In 2004 Certify that 36,000 55-gallon drums of radioactive waste (containing approximately 108,000 curies) shipped by DOE to the Waste Isolation Pilot Plant are permanently disposed of safely and according to EPA standards.

In 2003 36,041 drums (55 gallon) of radioactive waste shipped by DOE to the Waste Isolation Pilot Plant were permanently disposed of safely and according to EPA standards.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Number of 55-Gallon Drums of Radioactive Waste Disposed of According to EPA Standards	36,041	36,000	40,000	Drums

Baseline: The Waste Isolation Pilot Plant (WIPP) near Carlsbad, NM was opened in May 1999 to accept radioactive transuranic waste. By the end of FY 2003, approximately 73,000 (cumulative) 55 gallon drums will be safely disposed. In FY 2005, EPA expects that DOE will ship an additional 40,000 55-gallon drums of waste. Through FY 2004, EPA expects that DOE will have shipped safely and according to EPA standards, approximately 13% of the planned waste volume, based on disposal of 860,000 drums over the next 40 years. Number of drums shipped to the WIPP facility on an annual basis is dependent on DOE priorities and funding. EPA volume estimates are based on projecting the average shipment volumes over 40 years with an initial start up.

Build National Radiation Monitoring System

In 2005 EPA will purchase 60 additional state of the art monitoring units and initiate deployment to sites selected based on population and geographical coverage. All old sampling will be replaced and population coverage will be expanded to 60%.

In 2004 EPA will purchase 60 state of the art radiation monitoring units thereby increasing EPA radiation monitoring capacity and population coverage from 37% of the contiguous U.S. population in FY 2002 to 50% in FY 2004.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Purchase and Deploy State-of-the Art Monitoring Units		60	60	Units Purchased

Baseline: The current fixed monitoring system, part of the Environmental Radiation Ambient Monitoring System, was developed in the 1960s for the purpose of monitoring radioactive fallout from nuclear weapons testing. The system currently consists of 52 old, low-tech air particulate samplers which provide coverage in cities which represent approximately 24% of the population. By 2005, EPA will upgrade the old system by purchasing 120 state-of-the-art units which wil be strategically located to cover approximatley 60% of the population. The current system's air samplers will be retired from service due to age, although some may be retained for emergency use.

Homeland Security - Readiness & Response

In 2005 Verify that 50 percent of EPA's Radiological Emergency Response Team (RERT) members meet scenario-based response criteria.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Percentage of EPA RERT members that meet scenario-based criteria			50	Percent

Baseline: Currently, EPA assesses RERT readiness based on the ability of the RERT to: (1) provide effective field response, as defined today; (2) support coordination centers; and 3) provide analytical capabilities throughout as needed to support a single small-to-medium scale incident. These evaluation criteria will be reevaluated and revised in response to the Department of Homeland Security development of critieria for the Nuclear Incident Response Team established under the Homeland Security Act of 2002, which includes EPA RERT assets.

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Performance Measure: Purchase and Deploy State-of-Art Monitoring Units

Performance Data: Output Measure. Data from the near real-time gamma component of the Environmental Radiation Ambient Monitoring System (ERAMS) will be stored in an internal EPA database at the National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama. EPA monitors for radiation to provide data for nuclear and radiological emergency response assessments; to provide data on ambient levels of radiation in the environment for baseline and trend analysis; and to inform the general public and public officials.

Data Source: Environmental Radiation Ambient Monitoring System (ERAMS). A total of 60 near real-time monitoring units will provide data to the database at NAREL.

Methods, Assumptions and Suitability: Assuming that funding is secured during future years and the project receives all necessary approvals, the existing air sampling equipment will be replaced with state-of-the art air monitors that include near real-time gamma radiation detection capability. Addition of detectors and communication systems will provide notification about significant radioactive contamination events to decision- makers within hours

QA/QC Procedures: Quality Assurance and Quality Control Procedures will follow the Agency guidelines and be consistent with a specific Quality Assurance Plan that is being developed for the project. All monitoring equipment will be periodically calibrated with reliable standards and routinely checked for accuracy with onsite testing devices. Laboratory analyses of air filters and other environmental media are closely controlled in compliance with the NAREL Quality Management Plan and applicable Standard Operating Procedures.

Data Quality Reviews: The database will screen all incoming data from the monitoring systems for abnormalities as an indicator of either a contamination event or an instrument malfunction. Data will be held in a secure portion of the database until verified by trained personnel. Copies

of quality assurance and quality control testing will also be maintained to assure the quality of the data.

Data Limitations: Data are limited in near real-time to gamma emitting radionuclide identification and quantification. Radiation levels from gamma-emitting nuclides that will be so low as to be "undetectable" will be significantly below health concerns that require immediate action. Lower levels of radioactive materials in the samples will be measured through laboratory based analyses and data will be available within days after the sample is received. Data will not be available to the general public or others, except relevant decision-makers, until verified by trained personnel.

Error Estimate: The overall error in detection capability is estimated to be within 50% of the actual concentration based on previous experience with similar measurement systems. An error analysis will be performed on the prototype systems during the process of detector selection.

New/Improved Performance Data or Systems: New air samplers will maintain steady flow rates that are measured during operation and corrected for varying environmental conditions. Addition of gamma spectrometric detectors and computer-based multi-channel analyzers to the air samplers provide near real-time analyses of radioactive content in particles captured by the filter. In addition to data collection, the onboard computer systems can communicate results of analyses back to a central database and even identify abnormal conditions that might require action. These improvements not only include higher quality data, but also will provide information regarding contamination events to decision-makers within hours instead of days. The number and location of monitoring sites will be improved to provide representative sampling for much more of the nation's population.

References: For a additional information about the continuous monitoring system, ERAMS see: http://www.epa.gov/narel/erams/aboutus.html#mission

FY 2005 Performance Measure: Drums of Radioactive Waste Disposed of according to EPA Standards.

Performance Data: The Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) database contains the number of drums shipped by DOE waste generator facilities and placed in the DOE WIPP. The WIPP is a DOE facility located in southeastern New Mexico, 26 miles from Carlsbad. The WIPP Land Withdrawal Act was passed by Congress in October 1992 and amended in September 1996. The act transferred the land occupied by the WIPP to DOE and gave EPA regulatory responsibility for determining whether the facility complies with radioactive waste disposal standards.

Data Source: Department of Energy

Methods, Assumptions and Suitability: N/A

QA/QC Procedures: The performance data used by EPA are collected and maintained by DOE. Under EPA's WIPP regulations (available on the Internet: http://www.epa.gov/radiation/wipp/background.htm, all DOE WIPP-related data must be collected and maintained under a comprehensive quality assurance program meeting consensus

standards developed by the American Society of Mechanical Engineers (ASME) (available on the Internet: http://www.asme.org/codes/). EPA conducts regular inspections to ensure that these quality assurance systems are in place and functioning properly; no additional QA/QC of the DOE data is conducted by EPA.

Data Quality Reviews: N/A

Data Limitations: The DOE WIPP database contains the number of drums shipped by DOE waste generator facilities and placed in the DOE WIPP. Currently, there are five DOE waste generator facilities that are approved to generate and ship waste: Los Alamos National Laboratory, Rocky Flats Environmental Technology Site, Hanford Site, Idaho National Engineering and Environmental Laboratory, Savannah River Site.

Before DOE waste generator facilities can ship waste to the WIPP, EPA must approve the waste characterization controls and quality assurance procedures for waste identification at these sites. EPA conducts frequent independent inspections and audits at these sites to verify continued compliance with radioactive waste disposal standards and to determine if DOE is properly tracking the waste and adhering to specific waste component limits. Since 1998, EPA has completed over 60 inspections prior to shipment of waste to the WIPP facility. Once EPA gives its approval, the number of drums shipped to the WIPP facility on an annual basis is dependent on DOE priorities and funding. EPA volume estimates are based on projecting the average shipment volumes over 40 years with an initial start up.

New/Improved Data or Systems: None

References: The Department of Energy National TRU Waste Management Plan Quarterly Supplement http://www.wipp.ws/library/caolib.htm#Controlled contains information on the monthly volumes of waste that are received at the DOE WIPP.

FY 2005 Performance Measure: Percentage of EPA RERT members that meet scenario-based criteria.

Performance Data: To determine the effectiveness of RERT performance, an output measure has been developed that scores RERT members on a scale of one (1) to 100 against scenario-based criteria. A baseline evaluation was performed in Fiscal Year (FY) 2003, based on the effectiveness of the RERT in responses to actual incidents and a major national exercise (TOPOFF2). RERT members were evaluated in their ability to: (1) provide effective field response, (2) support coordination centers, and (3) provide analytical capabilities and throughput as needed to support a single small-to-medium scale incident. Overall RERT effectiveness in this baseline analysis was measured at approximately 13 percent. In FY 2005, however, the evaluation criteria will need to be reevaluated and revised in response to the changes enacted by the Homeland Security Act of 2002. Under this Act, the Department of Homeland Security (DHS) is required to develop evaluation criteria and test the effectiveness of the Nuclear Incident Response Team (NIRT), which will include EPA RERT assets. Thus, the output measure tentatively outlined above will be modified in cooperation with DHS to meet their needs.

Data Source: Beginning in FY 2005, EPA expects the Department of Homeland Security to maintain the data. DHS is responsible for assuring that all Federal Emergency Response assets

maintain an adequate level of readiness (Homeland Security Act of 2002). EPA assumes they also will maintain a data system to evaluate and assess the readiness of assets across the federal government. EPA will perform evaluations of its own assets and report results under this measure, but must rely on the DHS data source for key information.

Methods, Assumptions and Suitability: N/A

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: The expectations for performance of EPA's RERT are currently evolving. Under Section 501 of the Homeland Security Act of 2002, Department of State's (DOS) Under Secretary for Emergency Preparedness and Response will establish standards for EPA RERT assets as part of the new Nuclear Incident Response Team. DHS will also evaluate the NIRT's performance against these new standards. These criteria have not yet been developed. In addition, the requirements for the RERT (i.e., what is actually expected of RERT members during a response) may also change. This uncertainty means that the current evaluation may not effectively reflect future criteria.

New/Improved Data or Systems: None

References: The Homeland Security Act of 2002

COORDINATION WITH OTHER AGENCIES

In addition to the specific activities described above, EPA continues to work with Federal agencies including NRC, DOE, and DHS to prevent metals and finished products suspected of having radioactive contamination from entering the country. EPA also works with the Department of Transportation on initiatives to promote use of non-nuclear density gauges for highway paving.

STATUTORY AUTHORITIES

Atomic Energy Act of 1954, as amended, 42 U.S.C 2011 et seq. (1970), and Reorganization Plan #3 of 1970
Clean Air Act Amendments of 1990 (CAA)
Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)
Energy Policy Act of 1992, P.L. 102-486
Executive Order 12241 of September 1980, National Contingency Plan, 3 CFR, 1980
Executive Order 12656 of November 1988, Assignment of Emergency Preparedness Responsibilities, 3 CFR, 1988.
Nuclear Waste Policy Act of 1982
Public Health Service Act, as amended, 42 U.S.C 201 et seq.

Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, 42 U.S.C 5121 et seq.
Safe Drinking Water Act
Title X IV of the National Defense Authorization Act of 1996 (Nunn-Lugar II)
Uranium Mill Tailings Radiation Land Withdrawl Act of 1978
Waste Isolation Pilot Plan (WIPP) Land Withdrawal Act

OBJECTIVE: Reduce Greenhouse Gas Intensity

Through EPA's voluntary climate protection programs, contribute 45 million metric tons of carbon equivalent (MMTCE) annually to the President's 18 percent greenhouse gas intensity improvement goal by 2012. (An additional 75 MMTCE to result from the sustained growth in the climate programs are reflected in the Administration's business-as-usual projection for greenhouse gas intensity improvement.)

Resource Summary
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Reduce Greenhouse Gas Intensity	**$99,836.4**	**$106,936.5**	**$108,389.3**	**$1,452.9**
Environmental Program & Management	$97,647.6	$105,343.7	$106,712.6	$1,368.9
Science & Technology	$750.0	$0.0	$0.0	$0
Buildings & Facilities	$965.4	$969.6	$1,044.9	$75.4
Inspector General	$473.5	$623.2	$631.8	$8.6
Total Workyears	251.3	244.1	244.6	0.5

Program Project
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Climate Protection Program	$82,169.5	$91,289.6	$91,961.3	$671.7
Congressionally Mandated Projects	$1,018.2	$0.0	$0.0	$0.0
Administrative Projects	$16,648.7	$15,646.9	$16,428.0	$781.2
TOTAL	**$99,836.4**	**$106,936.5**	**$108,389.3**	**$1,452.9**

FY 2005 REQUEST

Results to be Achieved under this Objective

In February 2002, the President announced a new approach to global climate change designed to harness the power of the markets and technological innovation. The President committed America to reduce the greenhouse gas intensity of the U.S. economy (how much we emit per unit of economic activity) by 18 percent by 2012. Meeting this commitment will prevent more than 500 million metric tons of carbon-equivalent emissions through 2012. This approach focuses on reducing the growth of GHG emissions, while sustaining the economic

growth needed to finance investment in new, clean energy technologies. Focusing on greenhouse gas intensity sets America on a path to slow the growth of greenhouse gas emissions, and—as the science justifies—to stop and then to reverse that growth.

Overall, EPA's climate protection programs may prevent as much as 185 MMTCE annually by 2012, up from an estimated 65 MMTCE in 2002. Of the additional 120 MMTCE that will be prevented annually by 2012, 75 MMTCE will result directly from the sustained growth in many of the existing climate programs and are reflected in the Administration's business-as-usual projection for greenhouse gas intensity improvement; another 45 MMTCE will contribute towards President's 18 percent greenhouse gas intensity improvement goal.

EPA's voluntary climate programs work in partnership with businesses and other sectors through programs that deliver multiple benefit from cleaner air to lower energy bills—while improving overall scientific understanding of climate variability and change and its potential consequences. In FY 2005, EPA expects to continue the significant accomplishments of its Climate Protection Programs and contribute to reducing the Nation's greenhouse gas intensity.

EPA's international activities will lead to increases in the amount and quality of information and technical capacity available for decisions-makers in key developing and industrialized countries to implement emissions reductions policies and programs. Ultimately, these activities will lead to the reduction of trans-boundary air pollution and greenhouse gas emissions.

Climate Protection Program

The core of EPA's climate change efforts are voluntary government/industry partnership programs designed to capitalize on the opportunities that consumers, businesses, and organizations have for making sound investments in efficient equipment, policies and practices, and transportation choices. In ten years, we expect that more than half the Nation's anthropogenic greenhouse gas emissions will come from equipment purchased between now and then. Thousands of equipment purchases are made every day, and often people buy the equipment that is the least costly, and often least energy efficient, thereby committing themselves to higher energy bills in the future. At the same time, people often overlook the investment opportunities represented by more energy efficient equipment—investment opportunities with the potential of more than double the return on investment of other common options (e.g., money markets, U.S. Treasury bonds).

EPA manages a number of efforts, such as its ENERGY STAR programs, voluntary transportation efficiency programs, and the EPA Clean Automotive Technology (CAT) program (included under the Science Objective), to remove market barriers to deployment of energy efficient technology in the residential, commercial, transportation, and industrial sectors of the economy. EPA programs do not provide financial subsidies. Instead, they work by overcoming widely acknowledged market barriers to energy efficiency: lack of clear, reliable information on technology opportunities; lack of awareness of energy efficient products and services; lack of financing options to turn life cycle energy savings into initial cost savings for consumers; low incentives to manufacturers for efficiency research and development; and lack of awareness about energy efficient transportation choices.

EPA's newest voluntary programs build on previous accomplishments. In 2001, EPA launched partnership programs to promote cleaner, more efficient energy supply through increased renewable energy and combined heat and power (CHP) applications. These "distributed energy" technologies continue to break the link between our Nation's increased energy demand and air pollution. CHP and renewable power also help meet the growing need for decentralized, highly reliable power as our nation's electric grid ages. In FY 2003, EPA expanded the national Combined Heat and Power Partnership and the Green Power Partnership. EPA also expanded its Climate Leaders program, an effort launched in FY 2002 to encourage individual companies to develop long-term, comprehensive climate change strategies and emissions reduction goals. In 2003, Climate Leaders grew to 50 partners.

In addition, EPA began forming partnerships and initiated a number of transportation efforts focusing both on the industry and on state and local sectors, including a program to implement voluntary ground freight management practices as well as technologies that can substantially improve load scheduling and load matching logistics, reduce truck engine idling, and improve truck fuel-efficiency.

These partnerships can be extended globally to provide support for greenhouse gas management activities in other countries of the world. In 2005, EPA will continue activities that recognize and provide support for environmental issues in other countries, such as global air quality, energy access and efficient, renewable energy, transportation alternatives, and solid waste management (for methane reduction).

EPA has had substantial success across its Climate Protection Programs. Through FY 2003, EPA's Climate Protection Programs (see Table 1) reduced emissions of carbon dioxide (CO_2) and other greenhouse gases such as methane and perfluorocarbons (PFCs). In addition, EPA's Climate Protection Programs have locked in substantial energy and environmental benefits over the next decade. Since many of the investments promoted through EPA's climate programs involve energy efficient equipment with lifetimes of decades or more, the investments that have been spurred through 2003 will continue to deliver environmental and economic benefits through 2012 and beyond. EPA currently estimates that, based on investments in equipment already made due to EPA's programs through 2003, organizations and consumers across the country may net savings of more than $85 billion through 2012, and could reduce greenhouse emissions by more than 500 MMTCE through 2012 (cumulative reductions based upon estimated 2003 achievements).[92] These programs continue to be cost-effective approaches for delivering environmental benefits across the country.

In FY 2003 alone, EPA's Climate Protection Programs are expected to produce the following results, to be reported for the Government Performance and Results Act (final results will be available in late calendar year 2004):

- reduce greenhouse gas emissions by more than 80 MMTCE; and
- reduce energy consumption by an estimated 100 billion kilowatt hours.

[92] Climate Protection Partnerships Division, U.S. Environmental Protection Agency. 2003. Change for the Better, ENERGY STAR and Other Voluntary Programs, 2002 Annual Report.

In FY 2003, EPA's Climate Protection Programs also are on track to:

- conserve enough energy to light 100 million homes for the year;
- prevent almost 200,000 tons of emissions of nitrogen oxide (NO_x); and
- avoid greenhouse gas emissions equivalent to the emissions of 45 million automobiles for the year.

Table 1: EPA's Climate Protection Programs		
Sector	Program	Activity/Initiative
Buildings	*ENERGY STAR*	*Buildings*
		Labeled Products
		Homes
Industry	*Carbon Reduction Programs (CO2)*	*ENERGY STAR for Industry*
		Combined Heat and Power Partnership
		Green Power Partnership
		Climate Leaders
		Waste Wise
	Methane Programs (CH4)	*Natural Gas STAR Program*
		Landfill Methane Outreach Program
		Coalbed Methane Outreach Program
		Agricultural Programs (Ruminant Livestock Outreach and AgSTAR)
		Landfill Rule
	Programs to Reduce High Global Warming Potential Gases (HFCs, PFCs, SF6)	*Voluntary Aluminum Industrial Program*
		PFC Reduction/Climate Partnership for the Semiconductor Industry
		SF6 Emissions Reduction Partnership for the Electric Power System
		SF6 Emissions Reduction Partnership for the Magnesium Industry
		Partnership with HCFC-22 manufacturers to reduce HFC-23 emissions
		Significant New Alternatives Policy (SNAP) Programs
		Voluntary Partnerships with SNAP Industry Sectors
Transportation (NOTE: fuel cell vehicles and hydrogen fuel technology as well as the clean automotive technology programs are included in the science objective).*	*Transportation Efficiency and Emission Reduction Programs*	*Best Workplaces for Commuters program – promoting a national standard of excellence for commuter benefits*
		SmartWay Transport Partnership – improve fuel efficiency and reduce emissions through voluntary adoption of technologies, including anti-idling and retrofit technologies
Carbon Removal		
State and Local Climate Change Outreach Program		
International Capacity Building		

EPA's climate change programs are on track to meet their greenhouse gas reduction goals through FY 2003, as shown in Figure 1, and continue to meet the challenge of higher emissions reduction goals. The programs are on target to meet or exceed their specific goals for reducing greenhouse gas emissions and energy consumption in 2003, as shown in Table 2 for key program categories:

- Buildings (the ENERGY STAR program);
- Industry programs working in partnership to reduce emissions of carbon dioxide (including ENERGY STAR, WasteWise and Clean Energy programs);
- Industry programs working in partnership to reduce emissions of methane;
- Industry programs working in partnership to reduce emissions of the HFC/PFC gases;
- Transportation; and
- State and local.

Figure 1. Overall Goals and Achievements for the Climate Protection Programs

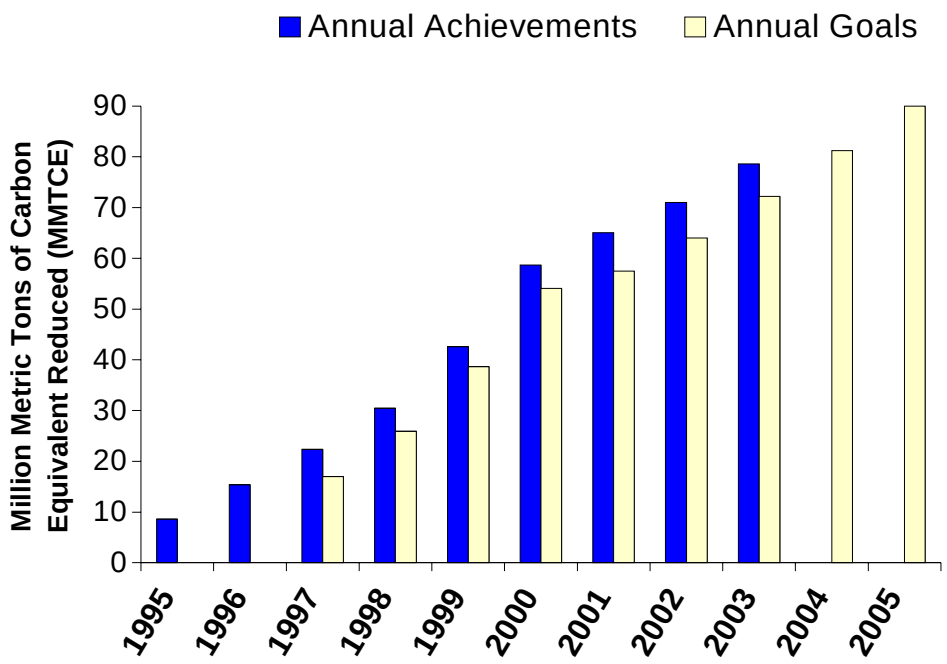


Table 2. Goals and Accomplishments for Performance Measures: 1998 through 2005[1]

Program Area/Key Gases		1999 Accomplished		2000 Accomplished		2001 Accomplished		2002 Accomplished		2003[2] Goal/Accomplished		2004[3] Goal		2005[3] Goal	
		kWh Saved (billion)	MMTCE reduced	kWh Saved (billion)	MMTCE reduced	kWh Saved (billion)	MMTCE reduced	kWh Saved (billion)	MMTCE reduced	kWh Saved (billion)	MMTCE reduced	kWh Saved (billion)	MMTCE reduced	kWh Saved (billion)	MMTCE reduced
Buildings (ENERGY STAR)[4]		**61**	**12.5**	**74**	**15.2**	**80**	**16.6**	**100**	**21.5**	95/**105**	19.2[5]/**23**	110	21.4[5]	120	23.8[5]
Industry	CO_2	Na	**5.3**	Na	**5.5**	Na	**5.8**	na	**6.7**	Na	6.7[5]/**6.7**	Na	7.3[5]	na	8.0[5]
	CH_4	Na	**8.3**	Na	**13.8**	Na	**16.0**	na	**16.8**	Na	17.0[5]/**18.0**	Na	18.1[5]	na	19.1[5]
	PFCs, SF_6, HFCs	Na	**15**	Na	**20.8**	Na	**22.8**[6]	na	**24.5**[6]	Na	24.9[5,6]/**29.2**	Na	29.6[5,6]	na	34.4[5,6]
Transportation		Na	**1.1**	Na	**1.7**	Na	**1.9**	na	**2.1**	Na	2.4[5]/**2.3**	Na	2.6[5]	na	2.9[5]
State and Local		Na	**1.4**	Na	**1.7**	Na	**1.9**	na	**2.0**	Na	2.0[5]/**2.0**	Na	2.0[5]	na	2.0[5]
Total		**61**	**44**	**74**	**59**	**80**	**65**	**100**	**73.5**	95[5]/**105**	72.2[5]/**81**	110[5]	81.0[5]	120[5]	90.2[5]

[1]Metrics are not applicable to CAT, International Capacity Building or Global Change Research. The accomplishments of many of EPA's voluntary programs are documented in the Climate Protection Partnerships Division Annual Report. The most recent version, *Change for the Better: Energy Star and Other Voluntary Programs,* Climate Protection Partnerships Division 2002 Annual Report

[2]These results are estimates. Final results will be available in calendar 2004.

[3]The Third National Communication to the Secretariat of the Framework Convention on Climate Change (FCCC) reporting on national progress was submitted in FY 2002. The report provided updated information on U.S. climate protection programs including actual FY 2000 accomplishments and projected benefits in 2010. Goals for the climate protection programs were reviewed and refined as part of this interagency process.

[4]EPA's ENERGY STAR program spans the Building sector and the Industrial sector.

[5]GPRA performance measure.

[6]These goals and accomplishments do not include EPA's efforts on self-chilling cans, which resulted in the avoidance of potentially significant emissions of HCFCs into the atmosphere.

Program Goals and Objectives for FY 2005

EPA's programs have made strides date, but opportunities remain to achieve further greenhouse gas emissions reductions and energy bill savings from energy efficiency programs and greater cost-effective use of renewable energy. American families and businesses spend over $600 billion each year on energy bills. Technologies are available today that can cut this energy use significantly.

Over the next several years, EPA will build upon its voluntary government/industry partnership efforts to achieve even greater greenhouse gas reductions as part of the President's plan to reduce greenhouse gas intensity by 18 percent in 2012. EPA will continue to break down market barriers and foster energy efficiency programs, products and technologies, cost-effective renewable energy, and greater transportation choices. EPA will continue to work closely with state and local partners to assess the benefits of reducing greenhouse gas emissions and developing practical risk reduction strategies. The Agency will develop international partnerships that will link industrial efficiency, reduction of greenhouse gases, and sustainable development. In FY 2005, EPA's climate change programs will work to:

- reduce greenhouse gas emissions from projected levels;
- reduce U.S. energy consumption from projected levels;
- reduce emissions of air pollutants such as NO_x, particulate matter, and mercury through activities that foster increased energy efficiency;
- continue to expand the ENERGY STAR program in the residential, commercial, and industrial sectors;
- develop voluntary partnerships with the freight industry to substantially increase the market penetration of diesel engine retrofits, anti-idling technologies, speed management practices, improved aerodynamic truck designs and other practices under the SmartWay Transport initiative that cost-effectively improve fuel efficiency;
- expand energy efficient commute options like carpools, transit, and telecommuting to reduce vehicle miles of travel by more than two billion miles through the Best Workplaces for Commuters program;
- assist 10 key developing countries and countries with economies-in-transition in building their capacity to reduce emissions of greenhouse gases through cost-effective measures and participate actively in international discussions of climate protection and assist in the fulfillment of the U.S. obligations under the U.N. Framework Convention on Climate Change (UNFCCC) to facilitate technology transfer to developing countries;
- produce measurable international greenhouse gas emission reductions through clean industrialization partnerships with key developing countries;
- in close cooperation with USDA, analyze, identify, and develop specific opportunities to sequester carbon in agricultural soils, forests, other vegetation and commercial products, with benefits for agricultural productivity and the environment; and
- assess the potential consequences of climate variability and change on human health and ecosystems.

EPA will be working towards the following goals in each of the following program areas:

- Buildings (ENERGY STAR):[93] The Buildings Sector represents one of EPA's largest areas of potential, and at the same time is one of its most successful. EPA will continue the successful ENERGY STAR[94] partnerships in the residential and commercial buildings sector and prevent the emissions of 27 MMTCE in 2012 (in addition to the 20 MMTCE being prevented annually as of 2002). The efforts necessary in FY 2005 to achieve the 2012 goals are detailed in Table 3.

- Industry:[95] EPA will continue to build on the success of the voluntary programs in the industrial sector, focusing on reducing CO_2 emissions and continuing the highly successful initiatives to reduce methane emissions and emissions of the high global-warming-potential gases. EPA's goals for these efforts are to: greatly enhance the rate of energy and resource efficiency improvements in industry between now and 2012 through the ENERGY STAR and WasteWise programs; cost-effectively keep emissions of methane at 1990 levels or below through 2010; cost-effectively limit emissions of the more potent greenhouse gases (HFCs, PFCs, SF_6); and facilitate the use of renewable energy. EPA's industrial sector programs will prevent 80 MMTCE in 2012 (in addition to the 43 MMTCE being prevented annually as of 2002). The efforts necessary in FY 2005 to continue to achieve these 2012 goals are detailed in Table 4.

- Transportation: EPA will continue to build and enhance efficient and effective market-driven programs that address emissions of greenhouse gases from the transportation sector. The transportation sector of the economy contributes about one-third of all U.S. anthropogenic GHG emissions. The key elements of this effort are the SmartWay Transport Partnership and the Best Workplaces for Commuters program.

  The SmartWay Transport partnership works with the trucking and railroad industries to develop and deploy more fuel-efficient technologies and practices to achieve cleaner and more efficient vehicles and locomotives by adopting pollution control and energy saving technologies. At full implementation, this program has the potential to reduce greenhouse gases by 9 to 18 MMTCE annually. As a component of this program, EPA will continue to develop partnership agreements with truck fleets, the truck stop industry, manufacturers of idle control technologies, and local and state governments to create incentives for implementation of idle control technologies, and remove barriers that truckers have identified, and deploy idling reduction strategies along major transportation corridors. Idling strategies alone have the potential to save 1 billion gallons of

[93] Through the ENERGY STAR program, EPA promotes energy efficiency across the residential, commercial and industrial sectors. EPA expects to prevent 29 MMTCE through the ENERGY STAR program in 2012, in addition to the 23 MMTCE prevented in 2002.

[94] The ENERGY STAR program crosses two climate change program areas: Buildings and Industry. The total FY 2005 budget request for the ENERGY STAR program is $50.3 million.

[95] The Industrial Sector goals include the Agency's work with state and local governments, and state and local governments' work with industry to prevent greenhouse gas emissions.

diesel fuel per year, while reducing greenhouse gases by 2.5 MMTE, and NO_x by 200,000 tons.

The goal of Best Workplaces for Commuters is to offer innovative solutions to commuting challenges faced by U.S. employers and employees by promoting outstanding commuter benefits that reduce vehicle trips and miles traveled. By offering commuter benefits such as transit passes, telecommuting, and vanpool vouchers, employers meet the National Standard of Excellence for commuter benefits that improve air quality, traffic congestion, and energy security while reducing emissions of greenhouse gases. During FY 2004 and FY 2005, EPA will expand the Best Workplaces for Commuters program to the following metropolitan areas: New York, Washington DC, Atlanta, San Antonio, Houston, Phoenix, Tucson, Denver, San Francisco, and Sacramento. The Best Workplaces for Commuters program may cover approximately 2 million employees by the end of FY 2004, and 3.7 million employees in FY 2005.

EPA estimates that these voluntary programs have the potential to contribute over 13 MMTCE annually in GHG reductions by 2012, in addition to the 2 MMTCE being prevented annually as of 2002. In addition, by 2012, EPA estimates these programs could reduce over 200,000 tons of NO_x each year, as well as achieve significant reductions in PM emissions. The efforts necessary in FY 2005 to achieve these goals are detailed in Table 5.

- Carbon Removal: Carbon can be sequestered through changes in both forestry and agricultural practices, but these actions are not currently well understood or accepted in many sectors of the international and environmental communities. In addition, this potential is not always well-reflected in technical and economic analyses. EPA is working collaboratively with USDA to address the misconceptions regarding carbon sequestration and to ensure that this important mitigation option is developed in an environmentally sound and economically efficient way, and to facilitate the improved modeling of carbon sequestration options. EPA is supporting USDA's programs under the Farm Bill and other vehicles to promote carbon sequestration and enhanced methane recovery, which could result in greenhouse gas reductions of up to 12 MMTCE by 2012. The efforts necessary in FY 2005 to achieve these 2012 goals are detailed in Table 6.

- State and Local: States and localities have a significant and an important role in voluntary efforts to reduce our country's GHG intensity, but need information, analyses and tools they need to integrate energy, air quality, and GHG reduction objectives and promote consistent, voluntary strategies.

  The state and local program responds to this need by providing tools, analyses and information about the benefits of voluntarily reducing emissions of GHGs. EPA will continue its efforts to build capacity and to provide state and local governments with technical, outreach, and/or education services about integrated approaches, so that state and local governments may more effectively address their environmental, human health, and economic goals in a comprehensive manner. These efforts are detailed in Table 6.

- International Capacity Building: EPA is working with a number of key developing countries to help them: 1) design and implement programs to increase the use of low and zero greenhouse gas technologies; 2) identify, evaluate, and implement strategies for achieving multiple social and health or economic benefits while reducing greenhouse gas emissions; 3) facilitate more significant actions to reduce GHG emissions by these countries under the United Nations Framework Convention on Climate Change (UNFCCC) and help develop the infrastructure necessary to implement these actions; and, 4) accurately assess GHG emissions from the transportation sector in these countries and help to implement less energy-intensive transportation strategies. Over the next ten years, EPA's goals are to: 1) catalyze increases in voluntary, market-driven programs for increasing the use of low and zero greenhouse gas technologies; 2) encourage full consideration of climate variability and change into countries' future development plans; and 3) establish the technical and institutional basis for key developing countries to take significant actions to reduce GHG emissions consistent with UNFCCC. The efforts necessary in FY 2004 to meet these goals are detailed in Table 6.

Table 3. EPA's ENERGY STAR Buildings Program: Description of Planned Activities Within FY 2005 Budget Request	
ENERGY STAR Buildings	Actively promote EPA's national energy performance rating system and work with building owners and managers to benchmark an average of 19 percent of the market across office buildings, schools, Federal and state facilities, retail spaces, hospitals, hotels, dormitories, and restaurants. Award 2,800 Energy Star labels to buildings that reach a benchmark score between 75 and 100. Continue to work closely with the energy services industry to assist these companies in integrating EPA's national energy performance rating system into their customer services, leading to 5,000 benchmarked buildings. Have 10,000 small businesses and congregations look to ENERGY STAR to save energy and reduce operating costs. Continue to promote the financial value of ENERGY STAR and energy efficiency with the Wall Street and financial community. Actively work to improve the efficiency of the Federal government – by working with other agencies to implement key pieces of the Federal Executive Order on building energy efficiency, particularly focusing on assisting agencies to benchmark their buildings and to procure energy efficient products. Develop benchmark capabilities for two additional space types.
ENERGY STAR Products	Implement three seasonal, nationally coordinated, consumer outreach campaigns raising awareness of the environmental benefits associated with using energy efficient air conditioning, lighting, and home electronics. Coordinate with utility and state partners representing more than 65% of U.S. households in the design and operation of effective state-level energy efficiency programs. Enhance Energy Star labeled product quality through a review of performance specifications for 5 product categories. Continue working with retailers and equipment contractors to ensure that consumers receive clear information when in the market to purchase products. Continue working in partnership with Canada, the European Community, Japan, Taiwan, Australia, and New Zealand in implementing energy efficiency labeling programs modeled after Energy Star. Promote the purchase of about 175 million Energy Star labeled products in 2005.
ENERGY STAR Homes	Over 150,000 new homes are expected to be constructed as Energy Star in 2005. Promote Energy Star Labeled New Homes in 25 geographic areas. Expand Energy Star to include 85% of the housing stock of the national builders, Pulte, Ryan and Centex. Achieve 75% penetration of Energy Star in the manufactured housing industry. Continue to promote Energy Star to HUD, and state and local housing authorities as the platform for their affordable housing programs. Work with major retailers, such as Home Depot, Lowes, and Sears, to promote ENERGY STAR Home Sealing to consumers. Promote proper installation, maintenance, and duct sealing of HVAC systems under the ENERGY STAR banner in 15 geographic regions. Extend Energy Star to the remodeler market.

Table 4. Industry Programs: Description of Planned Activities Within FY 2005 Budget Request	
ENERGY STAR for industry	Expand the Energy Star program to promote energy efficiency to nine industries. Enhance technical assistance provided to the industrial sector by developing plant energy performance indicators for three additional industries. Maintain the energy peer exchange networking opportunities for the broader U.S. industry by conducting two national meetings, along with a series of centralized peer exchanges accessible to all.
Combined Heat and Power Initiative	Expand efforts in the Northeast, Midwest, and Texas, working with state, local, and industry partners to facilitate 40 new CHP projects. Begin working in the Southeast and in the Northwest with emerging regional outreach programs. Maintain and publish a database of existing and planned projects in the U.S., to promote the greenhouse gas reductions associated with these projects. Continue to work with targeted state and local regulators to identify best practices for air regulations that encourage energy-efficient generation.
Green Power Partnership	Refine Green Power Partnership recruiting efforts to focus on large corporate and institutional electricity purchasers, and recruit 100 new Partners from this category. Continue developing a national market consensus on a benchmark for voluntary green power purchasing. Work with targeted states to leverage their renewable energy programs through policies such as emissions disclosure. Target green power providers for expanded collaboration in marketing, recognition events, and recruiting.
Climate Leaders	Maintain and update Climate Leaders greenhouse gas inventory protocol to incorporate lessons learned and Partner comments. Expand Climate Leaders program to 100 partners. Harmonize Climate Leaders inventory protocol with similar efforts at the national, state, and international level to reduce reporting burdens on Partners that participate in multiple programs. Announce 20 new voluntary corporate greenhouse gas reduction goals.
Waste Wise	Focus WasteWise efforts on new industry sector work, and on streamlined and improved data tracking on waste reduction. Expand efforts on coal ash cement via Coal Combustion Products Partnership (C2P2). Double the number of C2P2 participants expected to join from 50 to 100, and obtain buy in for two new industry-wide goals: 1) increasing the amount of coal ash used as a replacement for concrete from 14 million tons in 1992 to 20 million tons by 2010 (reducing future GHG emissions by approximately 5.4 million tons), and 2) increasing the overall use of C2P2s from 31% in 2002 to 45% in 2008. Continue to pursue a Product Stewardship approach for electronics recycling with tangible industry commitments and state support, leading to measurable increases in electronics recycling and associated climate benefits. Begin to measure benefits of new national carpet product stewardship agreement with pursuing additional Product Stewardship agreements in autos and beverage containers. Continue Green Building efforts aimed at increasing recovery of construction and landscaping materials and use of recovered materials in construction and landscaping. Continue to build partnerships and pilot innovative approaches with sectors that can influence the marketplace, including the military (on base deconstruction), WasteWise partners, and other large landowners. Work with key stakeholders to increase building deconstruction infrastructure and expertise. Provide research, outreach materials and technical assistance on the use of GHG emission factors for waste reduction to encourage their adoption nationwide.
Methane Programs	Continue Natural Gas STAR program in all sectors; increase industry-wide participation to 65%. Work with key stakeholders through EPA's Coalbed Methane Outreach Program (CMOP) to increase the market penetration of new greenhouse gas reduction technologies appropriate for combusting mine ventilation air. EPA will continue to provide technical assistance to mining operations as well as monitor and analyze the results from two demonstration projects and encourage demonstration of 3-4 new technical options. Assist an additional 50 landfills through the Landfill Methane Outreach Program (LMOP) in implement landfill gas-to-energy projects, and expand outreach and technical support for industrial and energy sector use of landfill gas energy. In the agriculture sector, continue expansion of methane-reducing technologies, such as anaerobic digesters, to help ensure clean water and air for the livestock sector.

Table 4. Industry Programs: Description of Planned Activities Within FY 2005 Budget Request (continued)	
Programs to Reduce High Global Warming Potential Gases	The Voluntary Aluminum Industry Partnership (VAIP) will continue to deliver reductions, with VAIP participants reducing the industry's emissions of PFCs by at least 70% percent from the 1990 baseline year, and begin implementing energy efficiency improvements. Work with the U.S. semiconductor partners to achieve their 10% PFC emissions reduction goal by 2010 from their 1995 baseline. Continue work with industry to increase participation in the SF_6 Emissions Reduction Partnership for Electric Power Systems to over 50% of the industry's net generating capacity and to achieve a sector-wide SF_6 emission reduction goal. Support the US magnesium partners' research and alternative cover gas trials to expedite the phase-out of SF_6, which is due to be completed in 2010. Maintain 100% participation with U.S. HCFC-22 chemical manufacturers to reduce emissions of HFC-23. Expand the stewardship programs to reduce high global warming potential emissions from other key sources such as the military and ODS replacement industries. SNAP expects to review and list 10 alternatives to ozone-depleting substances, focusing on the identification of safe and energy-efficient substitutes, including HFCs in various sectors.

Table 5. Transportation Programs: Description of Planned Activities Within FY 2005 Budget Request	
Transportation Efficiency	The Best Workplaces for Commuters program reduces emissions of smog-forming and toxic air pollutants and greenhouse gases by reducing the number of vehicle trips and vehicle miles traveled. EPA partners with employers who agree to adopt employee commuter benefit programs that meet a National Standard of Excellence for commuter benefits. In FY 2005 EPA will promote Best Workplaces for Commuters in at least 10 major metropolitan areas; expanding Best Workplaces for Commuters to include more than 4,000 employer partners; actively promoting commuter benefits to industries representing finance, insurance, real estate, government, retail, telecommunications, entertainment, health care, and universities; and expanding Best Workplaces for Commuters to encompass 3.7 million employees (2.7% penetration of U.S. commuters). The SmartWay Outreach Program promotes voluntary transportation programs**,** including a transportation information disclosure program, that educate the public or benefit the environment both globally by reducing CO2 emissions and locally by reducing NOx and other smog forming emissions. The SmartWay Outreach Program will achieve these emission reductions by implementing voluntary programs, including the SmartWay Transport Program and the Vehicle Information Program, and will explore other potential applications of the SmartWay concept**.** In FY 2005 the SmartWay Transport Partnership will reduce greenhouse gases, as well as NOx and PM emissions, by: • Partnering with up to 200 trucking companies in the U.S. and 3 of the 7 largest railroad companies. Partners will agree to reduce fuel consumption and emissions through the implementation of negotiated technologies and practices. • Partnering with up to 100 manufacturing, retail, and supply companies that hire or contract trucking and/or rail fleets. These companies will agree to hire rail and truck companies that are members of the SmartWay Transport Partnership. • Showcasing the emission control effectiveness, fuel efficiency, and commercial viability of innovative diesel emission control technologies. • Creating a rigorous technology evaluation program, to encourage the more rapid deployment of cleaner, more efficient technologies and practices. • Continuing the Agency's National Idle-Free Corridors project to develop a contiguous network of electrified truck stop parking spaces across the most heavily-traveled interstate freight corridors. Continue to provide technical assistance to state and local governments and to developing countries to develop and pilot innovative climate change mitigation options for the transportation sector.

Table 6. Other Programs: Description of Planned Activities Within FY 2005 Budget Request	
Carbon Removal	Continue to collaborate with USDA on the project development issues and determine the viability of various carbon sequestration activities as quantifiable means of limiting greenhouse gas emissions. Continue work on enhancing the ability of major macroeconomic models to evaluate the economic value of carbon sequestration and fully appreciate the role of carbon sequestration in reducing greenhouse gas emissions. Bring together leading experts from government, industry, and the research community to address several difficult issues related to sequestration projects, including permanence, leakage, monitoring, and verification. Enhance efforts to better quantify the ancillary impacts of carbon sequestration. Work with stakeholders in the forestry and agriculture sectors to promote the development of environmentally sustainable and economically attractive carbon sequestration projects domestically and internationally. Work with DOE and other stakeholders to understand emission reduction accounting and environmental impacts from carbon storage in geological formations.
State and Local	Provide targeted support, via analytical tools, guidance, and tailored technical support, to states requesting assistance with initiating and updating voluntary greenhouse gas inventories, developing and implementing voluntary GHG reduction strategies, and integrating GHG reductions into their overall planning. Support best practices by providing: training on new tools and models that build understanding of the broader human health and clean air benefits of reducing criteria pollutants; opportunities for training; and information on the environmental outcomes of voluntary programs. Conduct analyses, develop analytical tools, and provide technical assistance to EPA regions, states, and local air programs on integrating energy efficiency and renewable energy into SIPs through innovative measures. Develop tools to facilitate voluntary adoption of heat island reduction activities and integrate them into SIPs. Improve and enhance outreach products, including the EPA Global Warming and Heat Island websites, a guidebook on heat island mitigation strategies, and maintenance of a best practices clearinghouse to promote emission reduction strategies. Translate key scientific findings into a format more readily understandable to the public. Develop risk characterization methods to inform public response to climate change, and continue work on the strategic coastal response program.
International Capacity Building	Continue and expand cooperation with China, Mexico, Brazil, and India. Build the capacity in key developing countries (e.g., India and Russia) to develop reliable GHG emission inventories. Establish regional energy and GHG information networks in three major regions of the world. Improve energy efficiency practices in buildings in Russia and Kazakhstan. Continue to assist key developing countries in their efforts to identify and quantify mitigation measures that reduce local air pollutants and GHG emissions and that result in multiple environmental, health, social, and economic benefits. Establish partnerships with key developing countries to share and transfer energy efficiency program models and efficient energy technologies developed in the U.S.

FY 2005 CHANGE FROM FY 2004

EPM

- There are additional increases for payroll, cost of living, and enrichment for existing FTE.

ANNUAL PERFORMANCE GOALS AND MEASURES

Reduce Greenhouse Gas Emissions

In 2005 Greenhouse gas emissions will be reduced from projected levels by approximately 90 MMTCE per year through EPA partnerships with businesses, schools, state and local governments, and other organizations.

In 2004 Greenhouse gas emissions will be reduced from projected levels by approximately 81 MMTCE per year through EPA partnerships with businesses, schools, state and local governments, and other organizations.

In 2003 End of year FY 2003 data will be available in mid-2004 to verify that Greenhouse gas emissions will be reduced from projected levels by approximately 72.2 MMTCE per year through EPA partnerships with businesses, schools, state and local governments, and other organizations.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Annual Greenhouse Gas Reductions - All EPA Programs	Data Lag	81.0	90.2	MMTCE
Greenhouse Gas Reductions from EPA's Buildings Sector Programs (ENERGY STAR)	Data Lag	21.4	23.8	MMTCE
Greenhouse Gas Reductions from EPA's Industrial Efficiency/Waste Management Programs	Data Lag	7.3	8	MMTCE
Greenhouse Gas Reductions from EPA's Industrial Methane Outreach Programs	Data Lag	18.1	19.1	MMTCE
Greenhouse Gas Reductions from EPA's Industrial HFC/PFC Programs	Data Lag	29.6	34.4	MMTCE
Greenhouse Gas Reductions from EPA's Transportation Programs	Data Lag	2.6	2.9	MMTCE
Greenhouse Gas Reductions from EPA's State and Local Programs	Data Lag	2.0	2.0	MMTCE

Baseline: The baseline for evaluating program performance is a projection of U.S. greenhouse gas emissions in the absence of the U.S. climate change programs. The baseline was developed as part of an interagency evaluation of the U.S. climate change programs in 2002, which built on similar baseline forecasts developed in 1997 and 1993. Baseline data for carbon emissions related to energy use is based on data from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model of the U.S. electric power sector. Baseline data for non-carbon dioxide (CO2) emissions, including nitrous oxide and other high global warming potential gases are maintained by EPA. Baseline information is discussed at length in the U.S. Climate Action Report 2002 (www.epa.gov/globalwarming/publications/car/index.html), which provides a discussion of differences in assumptions between the 1997 baseline and the 2002 update, including which portion of energy efficiency programs are included in the estimates. EPA develops the non-CO2 emissions baselines and projections using information from partners and other sources. EPA continues to develop annual inventories as well as update methodologies as new information becomes available.

Reduce Energy Consumption

In 2005 Reduce energy consumption from projected levels by more than 120 billion kilowatt hours, contributing to over $8.5 billion in energy savings to consumers and businesses.

In 2004 Reduce energy consumption from projected levels by more than 110 billion kilowatt hours, contributing to over $7.5 billion in energy savings to consumers and businesses.

In 2003 End of year FY 2003 data will be available in late 2004 to verify the reduction in energy consumption from projected levels by more than 95 billion kilowatt hours, contributing to over $6.5 billion in energy savings to consumers and businesses.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Annual Energy Savings - All EPA Programs	Data Lag	110	120	Billion kWh

Baseline: The baseline for evaluating program performance is a projection of U.S. greenhouse gas emissions in the absence of the U.S. climate change programs. The baseline was developed as part of an interagency evaluation of the U.S. climate change programs in 2002, which built on similar baseline forecasts developed in 1997 and 1993. Baseline data for carbon emissions related to energy use is based on data from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model of the U.S. electric power sector. Baseline data for non-carbon dioxide (CO2) emissions, including nitrous oxide and other high global warming potential gases are maintained by EPA. Baseline information is discussed at length in the U.S. Climate Action Report 2002 (www.epa.gov/globalwarming/publications/car/index.html), which provides a discussion of differences in assumptions between the 1997 baseline and the 2002 update, including which portion of energy efficiency programs are included in the estimates. EPA develops the non-CO2 emissions baselines and projections using information from partners and other sources. EPA continues to develop annual inventories as well as update methodologies as new information becomes available.

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Performance Measure: Annual Greenhouse Gas Emissions Reductions overall and by Sector

Performance Database: Climate Protection Partnerships Division Tracking System.

Data Source: Baseline data for carbon emissions related to energy use comes from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model of the U.S. electric power sector. Baseline data for non-carbon dioxide (CO_2) emissions, including nitrous oxide and other high global warming potential gases, are maintained by EPA. Baseline information is discussed at length in the U.S. Climate Action Report 2002. EPA develops the carbon and non-CO_2 emissions baselines and projections using information from partners and other sources. Data collected by EPA's voluntary programs include partner reports on facility- specific improvements (e.g. space upgraded, kilowatt-hours (kWh) reduced), national market data on shipments of efficient products, and engineering measurements of equipment power levels and usage patterns.

Methods, Assumptions, and Suitability: Most of the voluntary climate programs' focus is on energy efficiency. For these programs, EPA estimates the expected reduction in electricity consumption in kilowatt-hours (kWh). Emissions prevented are calculated as the product of the kWh of electricity saved and an annual emission factor (e.g., million metric tons carbon equivalent (MMTCE) prevented per kWh). Other programs focus on directly lowering greenhouse gas emissions (e.g., Natural Gas STAR, Landfill Methane Outreach, and Coalbed Methane Outreach); for these, greenhouse gas emission reductions are estimated on a project-by-project basis. EPA maintains a "tracking system" for emissions reductions.

QA/QC Procedures: EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from voluntary programs. Peer-reviewed carbon-conversion factors are used to ensure consistency with generally accepted measures of Greenhouse Gas (GHG) emissions, and peer-reviewed methodologies are used to calculate GHG reductions from these programs.

Data Quality Review: The Administration evaluates its climate programs using an interagency approach. The second such interagency evaluation included participants from EPA and the Departments of State, Energy, Commerce, Transportation, and Agriculture. The previous evaluation was published in the *U.S. Climate Action Report-1997*. A 1997 audit by EPA's Office of the Inspector General concluded that the climate programs examined "used good management practices" and "effectively estimated the impact their activities had on reducing risks to health and the environment..."

Data Limitations: These are indirect measures of GHG emissions (carbon conversion factors and methods to convert material-specific reductions to GHG emissions reductions). Also, the voluntary nature of the programs may affect reporting. Further research will be necessary in order to fully understand the links between GHG concentrations and specific environmental impacts, such as impacts on health, ecosystems, crops, weather events, and so forth.

Error Estimate: These are indirect measures of GHG emissions. Although EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from voluntary programs, errors in the performance data could be introduced through uncertainties in carbon conversion factors, engineering analyses, and econometric analyses.

New/Improved Data or Systems: The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. EPA continues to update inventories and methodologies as new information becomes available.

References: The U.S. Climate Action Report 2002 is available at: www.epa.gov/globalwarming/publications/car/index.html. The accomplishments of many of EPA's voluntary programs are documented in the Climate Protection Partnerships Division Annual Report. The most recent version is *Change for the Better: Energy Star and Other Voluntary Programs,* Climate Protection Partnerships Division 2002 Annual Report.

FY 2005 Performance Measure: Annual Energy Savings

Performance Database: Climate Protection Partnerships Division Tracking System

Data Source: Data collected by EPA's voluntary programs include partner reports on facility specific improvements (e.g. space upgraded, kilowatt-hours (kWh) reduced), national market data on shipments of efficient products, and engineering measurements of equipment power levels and usage patterns.

Methods, Assumptions, and Suitability: Most of the voluntary climate programs' focus is on energy efficiency. For these programs, EPA estimates the expected reduction in electricity consumption in kilowatt-hours (kWh). Emissions prevented are calculated as the product of the kWh of electricity saved and an annual emission factor (e.g., MMTCE prevented per kWh). Other programs focus on directly lowering greenhouse gas emissions (e.g., Natural Gas STAR, Landfill Methane Outreach, and Coalbed Methane Outreach); for these, greenhouse gas emission reductions are estimated on a project-by-project basis. EPA maintains a tracking system for energy reductions.

Energy bill savings are calculated as the product of the kWh of energy saved and the cost of electricity for the affected market segment (residential, commercial, or industrial) taken from the Energy Information Administration's (EIA) *Annual Energy Outlook 2002* and *Annual Energy Review 2000* for each year in the analysis (1993-2012). Energy bill savings also include revenue from the sale of methane and/or the sale of electricity made from captured methane. The net present value (NPV) of these savings was calculated using a 4-percent discount rate and a 2001 perspective.

QA/QC Procedures: EPA devotes considerable effort to obtaining the best possible information on which to evaluate energy savings from its voluntary programs.

Data Quality Review: The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. The second such interagency evaluation included participants from EPA and the Departments of State, Energy, Commerce, Transportation, and Agriculture. The results were published in the *U.S. Climate Action Report-2002* as part of the United States' submission to the Framework Convention on Climate Change (FCCC). The previous evaluation was published in the *U.S. Climate Action Report-1997*. A 1997 audit by EPA's Office of the Inspector General concluded that the climate programs examined "used good management practices" and "effectively estimated the impact their activities had on reducing risks to health and the environment."

Data Limitations: The voluntary nature of programs may affect reporting. In addition, errors in the performance data could be introduced through uncertainties in engineering analyses and econometric analyses.

Error Estimate: Although EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from voluntary programs, errors in the performance data could be introduced through uncertainties in engineering analyses and econometric analyses.

New/Improved Data or Systems: The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. EPA continues to update inventories and methodologies as new information becomes available.

References: The U.S. Climate Action Report 2002 is available at: www.epa.gov/globalwarming/publications/car/index.html. The accomplishments of many of EPA voluntary programs are documented in the Climate Protection Partnerships Division Annual Report. The most recent version is *Change for the Better: Energy Star and Other Voluntary Programs*, Climate Protection Partnerships Division 2002 Annual Report.

COORDINATION WITH OTHER AGENCIES

Voluntary climate protection programs government-wide stimulate the development and use of renewable energy technologies and energy efficient products that will help reduce greenhouse gas emissions. The effort is led by EPA and DOE with significant involvement from USDA, the Department of Housing and Urban Development (HUD) and the National Institute of Standards and Technology.

Agencies throughout the government make significant contributions to the climate protection programs. For example, DOE will pursue actions such as promoting the research, development, and deployment of advanced technologies (for example, renewable energy sources). The Treasury Department will administer proposed tax incentives for specific investments that will reduce emissions. EPA is working with DOE to demonstrate technologies that oxidize ventilation air methane from coal mines. EPA is broadening its public information transportation choices campaign as a joint effort with DOT. EPA coordinates with each of the above-mentioned agencies to ensure that our programs are complementary and in no way duplicative.

This coordination is evident in work recently completed by an interagency task force, including representatives from the Department of State, EPA, DOE, USDA, DOT, OMB, Department of Commerce, USGCRP, NOAA, NASA, and the Department of Defense, to prepare the Third National Communication to the Secretariat as required under the FCCC. The FCCC was ratified by the United States Senate in 1992. A portion of the Third National Communication describes policies and measures (such as ENERGY STAR and EPA's Clean Automotive Technology initiative) undertaken by the U.S. to reduce greenhouse gas emissions, implementation status of the policies and measures, and their actual and projected benefits. One result of this interagency review process has been a refinement of future goals for these policies and measures which were communicated to the Secretariat of the FCCC in 2002. The "U.S. Climate Action Report 2002: Third National Communication of the United States of America under the United Nations Framework Convention on Climate Change" is available at: http://unfccc.int/resource/docs/natc/usnc3.pdf .

EPA works primarily with the Department of State, the Agency for International Development, and the Department of Energy as well as with regional organizations in implementing climate-related programs and projects. In addition, EPA partners with others worldwide, including international organizations such as the United Nations Environment

Programme, the United Nations Development Programme, the International Energy Agency, the OECD, the World Bank, the Asian Development Bank, and our colleagues in Canada, Mexico, Europe and Japan.

STATUTORY AUTHORITIES

Clean Air Act Amendments, 42 U.S.C. 7401 et seq. - Sections 102, 103, 104, and 108
Clean Water Act, 33 U.S.C. 1251 et seq. - Section 104
Federal Technology Transfer Act, 15 U.S.C. - Section 3701a
Global Climate Protection Act, 15 U.S.C. 2901 - Section 1103
National Environmental Policy Act, 42 U.S.C. 4321 et seq. - Section 102
Pollution Prevention Act, 42 U.S.C. 13101 et seq. - Sections 6602, 6603, 6604, and 6605
Solid Waste Disposal Act, 42 U.S.C. 6901 et seq. - Section 8001

OBJECTIVE: Enhance Science and Research

Through 2010, provide and apply sound science to support EPA's goal of clean air by conducting leading-edge research and developing a better understanding and characterization of environmental outcomes under Goal 1.

Resource Summary
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Enhance Science and Research	**$132,577.0**	**$128,016.6**	**$130,863.6**	**$2,847.1**
Environmental Program & Management	$16,904.8	$18,216.5	$18,723.8	$507.4
Science & Technology	$113,313.3	$107,353.4	$109,544.0	$2,190.6
Buildings and Facilities	$1715.0	$1,710.5	$1,840.5	$130.0
Inspector General	$643.9	$736.2	$755.3	$19.1
Total Workyears	385.2	371.2	372.4	1.1

Program Project
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Climate Protection Program	$19,588.0	$17,320.3	$17,458.9	$138.6
Radiation: Protection	$1,367.0	$1,472.1	$1,361.5	($110.6)
Research: Air Toxics	$14,257.2	$15,700.9	$17,638.9	$1,938.0
Research: Particulate Matter	$64,437.9	$63,620.6	$63,690.8	$70.2
Research: Troposphere Ozone	$4,804.2	$4,942.3	$4,900.9	($41.4)
Clean Air Allowance Trading Programs	$4,042.7	$3,991.2	$3,991.2	$0.0
Congressionally Mandated Projects	$3,810.2	$0.0	$0.0	$0.0
Federal Support for Air Quality Management	$408.0	$380.7	$482.4	$101.7
Federal Support for Air Toxics Program	$402.0	$403.1	$405.4	$2.3
Administrative Projects	$19,459.8	$20,185.4	$20,933.6	$748.3
TOTAL	**$132,577.0**	**$128,016.6**	**$130,863.6**	**$2,847.1**

FY 2005 REQUEST

Results to be Achieved Under this Objective

EPA undertakes and relies upon sound science in its clean air programs. The Agency uses science to determine the risks that air pollution poses to human health and the environment, and to identify the best means to detect, abate, and avoid environmental problems associated with air pollutants. To support the achievement of its clean air objectives and the overall goal of clean air for American communities and surrounding ecosystems, EPA will ensure that efforts to reduce environmental and human health risks are based on the best available scientific information. In addition, EPA will continue to integrate critical scientific assessment with policy, regulatory, and non-regulatory activities.

The tropospheric ozone research program develops tools and generates methods and data to support states, tribes, and the Agency as they identify and implement effective strategies to attain the National Ambient Air Quality Standards (NAAQS). Research results will be used to help determine which areas of the country attain the NAAQS for tropospheric ozone. Air quality simulation models and associated inputs (atmospheric chemistry and emissions models) produced from this research are used to support scientific analyses that serve as the basis for identifying the most cost-effective mix of controls that could be deployed in a particular area to meet the NAAQS.

Particulate matter (PM) exposure and health effects research will fill current gaps in our understanding of the observed excess mortality and disease associated with PM and will continue work to strengthen the scientific basis for the next review of the PM NAAQS in 2010 by conducting epidemiological, toxicological, clinical, and exposure studies of PM health effects. This will include research describing the health effects of different PM sizes, and specific effects (such as respiratory and cardiopulmonary) of ambient PM on select susceptible populations. In addition, human exposure research will provide information on relationships between ambient levels of PM and actual human exposure that lead to adverse health impacts. Results from the research will also help elucidate the health implications of PM emitted from specific source categories.

After the designation of non-attainment areas for the current PM NAAQS in 2005, states will have three years in which to develop State Implementation Plans (SIPs) that, once implemented, lead to cleaner air and PM NAAQS attainment. The PM research program will provide the latest data on the chemical and physical characteristics of source emissions and improve models to identify source contributions to locally observed PM concentrations. The program will evaluate risk management options and provide the air quality models to predict how various emission reduction strategies will impact future PM concentrations. These data and information, which are essential for SIP development, will help states identify sources of concern in their area and develop effective SIPs that bring the states into compliance as quickly as possible.

Air Toxics research contributes to the advancement of science in the areas of emissions, air quality modeling, human exposure, and health effects, to improve EPA's ability to assess public health risks associated with hazardous air pollutants (HAPs). The program scope includes risk assessment techniques and risk reduction options for mobile, indoor, and stationary sources

of air toxics including those where residual risks remain after existing technologies have been installed. These efforts support development and implementation of national risk reduction programs and community-level assessments.

Federal Support for Air Quality Management & Air Toxics Program/ Radiation: Protection

EPA will continue to conduct risk assessments on both criteria and hazardous air pollutants. These risk assessments will be used in support of our air toxics program and in estimating the risks associated with exposure to criteria pollutants, such as fine particles. EPA also conducts radiation risk assessments and provides the technical tools and the scientific basis for generating radionuclide-specific risk coefficients. Risk managers use this information to assess health risks from radiation exposure and to determine appropriate levels for contaminated site clean-up. This information is also utilized by EPA to develop radiation protection and risk management policy, guidance, and rulemakings.

Clean Air Allowance Trading Systems

The Clean Air Status and Trends Network (CASTNET) is a national long-term atmospheric deposition monitoring network. Established in 1987, it is the Nation's primary source for atmospheric data on the dry deposition component of total acid deposition, rural ground-level ozone and other forms of atmospheric pollution that enter the environment as particles and gases. Used in conjunction with the National Atmospheric Deposition Program (NADP), CASTNET determines the effectiveness of national emission control programs through monitoring geographic and long-term temporal trends in atmospheric deposition. CASTNET measures weekly average atmospheric concentrations of sulfate, nitrate, ammonium, sulfur dioxide and nitric acid and hourly concentrations of ambient ozone levels in rural areas. Currently, 79 monitoring stations operate across the United States. EPA operates most of the monitoring stations; however, the National Park Service operates 26 stations in cooperation with EPA.

Climate Protection Program

EPA manages a number of efforts, such as the Energy Star programs, voluntary transportation efficiency programs (all described under the Climate Change objective) as well as the EPA Clean Automotive Technology (CAT) program, to remove barriers in the marketplace and to deploy technology faster in the residential, commercial, transportation, and industrial sectors of the economy.

The transportation component of EPA's Climate Protection Programs has produced important advancements that will generate substantial energy and carbon benefits while improving America's competitiveness. EPA manages a number of efforts, such as the EPA Clean Automotive Technology program and the Fuel Cell and Hydrogen program, to develop advanced technologies, to remove technology barriers in the marketplace, and to deploy technology faster in the residential, commercial, transportation, and industrial sectors of the economy. (The Energy Star and voluntary transportation efficiency programs described under the Climate Change objective also remove barriers in the marketplace.)

The Agency's Clean Automotive Technology program will further develop advanced clean and fuel-efficient automotive technology with the end result being to better protect the environment and save energy. The Clean Automotive Technology program focuses efforts on achieving significant fuel economy gains by beginning to transfer the highly efficient hybrid powertrain components, originally developed for passenger car applications, to meet the more demanding size, performance, durability, and towing requirements of vehicles such as Sport Utility Vehicles (SUVs), pickup trucks, and urban delivery vehicles.

The emphasis of Clean Automotive Technology program work for the next 5-10 years will be research and collaboration with the automotive, trucking, and fleet industries under CRADAs, applying EPA's unique knowledge of hydraulic hybrid technology and advanced clean-engine technologies to vehicles such as large SUVs, pickup trucks, urban delivery trucks, school buses, shuttle buses, and refuse trucks. Through work within the CRADAs, significant elements of EPA's technologies will be demonstrated in real-world applications and introduced commercially by vehicle manufacturers between 2005 and 2010.

The Clean Automotive Technology program commits EPA to develop technology by the end of the decade to satisfy stringent criteria emissions requirements and up to a doubling of fuel efficiency in personal vehicles such as SUVs, pickups, and urban delivery vehicles -- while simultaneously meeting the more demanding size, performance, durability, and power requirements of these vehicles. Expanding this advanced technology into 50 percent of new light trucks by 2020 would generate annual fuel savings of 8 billion gallons, while tailpipe carbon emissions would fall by 20 MMTCE.

Under the Fuel Cell and Hydrogen program, EPA upgraded the facilities at the National Vehicle and Fuel Emissions Laboratory (NVFEL) to safely handle hydrogen, certified the first fuel cell vehicle, and announced new partnerships with industry and the Department of Energy. EPA will also play a leadership role in advancing fuel cell vehicle and hydrogen fuel technologies and influencing the direction of technological and policy progress in support of U.S. environmental, energy, and national security goals. EPA will achieve this by establishing the capability to test a range of fuel cell vehicles and components; taking the national lead in establishing emissions and fuel economy testing protocols and innovating safe laboratory handling of hydrogen fuel; establishing a peer-reviewed life cycle model and promoting its use in R&D and in policy decisions regarding fuel cell vehicle technology pathways; and working closely with other key stakeholders through public/private partnerships like the California Fuel Cell Partnership to facilitate the commercialization of innovative technologies.

In FY 2005, the Clean Automotive Technology Program will:

- demonstrate technology for a hydraulic-hybrid urban delivery vehicle or large SUV that achieves 40-70 percent better fuel efficiency than the typical baseline vehicle;
- provide CRADA partners the engineering expertise necessary to transfer EPA's unique and innovative hydraulic hybrid and clean-and-efficient engine technology;
- continue to participate in effective government/industry partnerships that advance fuel cell vehicle technology.

- certify fuel cell vehicles for several manufacturers;
- test and evaluate fuel cell vehicles as part of DOE's National Validation Program;
- establish national standards for life cycle modeling of fuel cells and fuels, establish rigorous test procedures for fuel cell vehicles;
- expand hydrogen refueling capabilities at NVFEL to support broader fuel cell demonstrations in Southeast Michigan, and to demonstrate the efficiency and economics of innovative hydrogen production technologies.

Research: Tropospheric Ozone

While many of the adverse effects of tropospheric ozone are well known,[96] controlling ozone is not an easy task because of the complex chemical reactions and atmospheric conditions influencing ozone formation. EPA's Tropospheric Ozone Research program provides the data and tools needed by Federal, state, tribal, and regional authorities to meet the NAAQS, and, in turn, to effect improvements in human health and the environment.

Tropospheric ozone research is guided by a Multi-Year Plan (MYP),[97] an important tool the Agency uses to ensure that the planned research is relevant to EPA and states needs and addresses the highest priority scientific questions. The MYP identifies research goals and priorities, specific research needed to address the most compelling science needs, and opportunities for collaboration and integration both within and outside of EPA. The MYP also communicates important research results. In FY 2005, the tropospheric ozone MYP will be combined with the PM MYP to form a comprehensive criteria pollutant MYP. This combined plan will undergo peer review by the Clean Air Science Advisory Committee (CASAC), a subcommittee of EPA's Science Advisory Board. (Criteria: Relevance)

As outlined in the MYP, in FY 2005 EPA's Tropospheric Ozone Research program will focus on improving the predictive capability of, and speeding up the processing time for, air quality models needed by the states to determine how best to meet the ozone NAAQS (Criterion: Performance). This will include improvements to the models used to estimate emissions of volatile organic compounds and nitrogen oxides that form ozone in the atmosphere, and producing refined estimates of natural source emissions from forests and more spatially resolved data on emissions from heavy-duty diesel trucks. The next release of the Community Multi-Scale Air Quality (CMAQ) model, widely used by states and cities, will incorporate these improved emission models and new atmospheric chemistry data. In addition, EPA will develop advanced measurement methods and diagnostic information to evaluate the models. The model improvements resulting from this research will provide Federal and state air quality managers with the improved tools they need to more easily identify and implement cost effective control strategies required to attain the ozone NAAQS.

96 U.S. EPA, Office of Air and Radiation. How Ground-level Ozone Affects the Way We Live and Breathe. Washington, DC: EPA. Accessed January 8, 2004. Available only on the Internet: http://www.epa.gov/air/urbanair/ozone/index.html

97 U.S. EPA, Office of Research and Development. Tropospheric Ozone Multi-Year Plan. Washington, DC: EPA. Accessed October 22, 2003. Available only on the Internet: http://www.epa.gov/osp/myp.htm#ozone

Research: Particulate Matter

EPA's PM research portfolio is aligned with the ten priority topics identified by the National Research Council (NRC),[98] which has conducted periodic reviews of the PM research program since 1998 to ensure the program's relevance to the highest priority research needs and to monitor research performance. In addition to the NRC, the CASAC and EPA's Board of Scientific Counselors (BOSC) periodically evaluate the PM research program's direction and products (Criterion: Quality). The Agency plans to complete an updated draft PM Research Strategy for CASAC review after completion of the final NRC report, which is expected in early 2004. The Strategy will outline research needs and priorities and the general approach the program will take to meet them. A PM Research Multi-Year Plan (MYP)[99] describes the specific research EPA will conduct to implement the Strategy. (Criterion: Relevance)

The PM MYP addresses the topics raised by the NRC, and describes several critical research issues included in multiple NRC topics. Among these critical research issues are: 1) differentiating between the health effects of PM and the health effects of other air pollutants; 2) identifying the health effects and biological mechanisms of PM constituents (e.g., sulfates versus nitrates versus organic and elemental carbon, and metals); 3) understanding the quantitative relationship between exposure to different particles and various health effects; and, 4) understanding human exposures to PM constituents and sources of PM. The PM MYP also addresses the need to improve information on the rate and characteristics of emitted particles and to improve modeling capabilities for predicting and quantifying future PM concentrations and their sources, and it describes the research needed to support the states as they implement plans to meet the PM NAAQS. (Criterion: Relevance)

- Differentiating between the health effects of PM and other air pollutants

Research designed to understand and disentangle the effects of PM and co-pollutants will include studies of how PM and other air pollutants interact as well as toxicology and human clinical studies to understand the effects of co-pollutants on PM health effects. Epidemiology studies and animal models will look at the health effects of PM and co-pollutants on specific populations (e.g. the elderly, children, those with respiratory illness) believed to be most vulnerable to PM. Some of the epidemiology studies will be conducted as part of EPA's large multidisciplinary study in Detroit, Michigan.

Related research will focus on identifying risk factors for vulnerable populations. This will include continuing research to identify these groups, and to develop animal models of human susceptibility. Collaborative epidemiology/exposure studies will identify harmful effects on vulnerable groups.

- Identifying the health effects and biological mechanisms of PM

98 For the latest report, see National Research Council. (2001) Research Priorities for Airborne Particulate Matter. III. Early Research Progress. Washington, DC: National Academy Press. Available on the internet: http://www.nap.edu/books/0309073375/html/ (6/4/03).

99 U.S. EPA, Office of Research and Development. Particulate Matter Multi-Year Plan. . Washington, DC: EPA. Accessed January 8, 2004. Available only on the Internet: http://www.epa.gov/osp/myp/pm.PDF (1/8/04)

Research in FY 2005 will address the need for a better understanding of the physical, chemical, and biological characteristics of particles responsible for adverse health effects, and the relationships between PM constituents and adverse health effects.

The Agency will continue to conduct studies of disease processes in vulnerable populations in order to shed light on existing evidence of long-term health effects of PM. These studies will better characterize and quantify effects and the constituents most responsible for the effects. Epidemiological, human clinical, and animal studies will evaluate and characterize the differences between PM sources, components, and fine, ultrafine, and coarse particles in healthy and compromised individuals and extrapolate between animals and humans. This will improve our ability to answer fundamental questions about the relative health risks attributed to PM components and size fractions so that National Ambient Air Quality Standards can be set to adequately protect public health.

As research results in additional information and understanding of the characteristics of PM components and mixtures most responsible for adverse health effects, EPA will engage in toxicological research to determine the underlying mechanisms through which minute concentrations of PM result in adverse health impacts.

- Understanding the quantitative relationship between exposure to different particles and various health effects

Health effects research to fill current gaps in our understanding of the observed health effects associated with PM will include determining dose-response relationships between PM and adverse health effects. Related research on populations especially vulnerable to PM will determine how the risk factors for these populations influence dose-response relationships.

- Understanding human exposures to PM constituents and sources of PM

Human exposure research will utilize both measurements and modeling to develop an improved understanding of the relationship of ambient levels of PM constituents to indoor and personal levels and to identify relative source contributions to personal exposures. EPA will accomplish much of this effort through a large multidisciplinary study in Detroit, Michigan. This study will include efforts to characterize human exposures to PM and air toxics and to relate those exposures to sources in the community. The field measurement portion of the Detroit study, initiated in FY 2004, will continue through FY 2006.

- Implementation research

Continuing research in FY 2005 will support the efforts of EPA, states, tribes, and local air quality officials to determine which areas attain the PM NAAQS, and provide them with tools to identify the most cost-effective mix of controls that could be deployed to meet the standards. This research will include monitoring and atmospheric measurements, development, and evaluation of air quality and source-receptor models, emissions characterization methods and measurements, and testing and evaluation of multi-pollutant control technologies.

Research to provide tools to quantify emissions, identify key sources of ambient PM, and develop the science to support control strategies for attaining clean air standards, will continue in

FY 2005. Atmospheric chemistry and modeling research will continue to support improvements in the predictive capabilities of the Community Multi-Scale Air Quality (CMAQ) modeling system for PM, and an updated version of CMAQ will be delivered to the states in FY 2005 for them to use for developing state implementation plans (R&D Criterion: Performance). Atmospheric measurement research will focus on developing and delivering to the states a Federal Reference Method and/or a Federal Equivalent Method for measuring coarse particles.

Continuing implementation-related research also will generate improved data on emissions for air quality models and help determine what sources are contributing to PM measured in ambient air through use of unique chemical fingerprints. This will include quantifying ammonia emissions (a precursor to PM formation in the atmosphere) from poultry and cattle raising operations and producing data on the rate and chemical composition of particles emitted from jet aircraft engines.

- PM Centers and Science to Achieve Results (STAR)[100]

Through a competitive process, EPA established five extramural PM Research Centers, lasting from 1999 to 2004 through EPA's Science to Achieve Results (STAR) research program. In FY 2005, EPA will issue new awards for Centers to conduct health effects, exposure, source apportionment, and PM NAAQS implementation research. In addition, in FY 2005 a major epidemiologic study on the health effects of long-term exposure to PM will be underway.

Other research supported by the STAR program will address aspects of PM health effects, such as mechanisms and susceptibility, and issues related to NAAQS implementation. The STAR research program uses a competitive peer review process to ensure that only high-quality research proposals receive funding support (Criterion: Quality). STAR is an integrated part of EPA's research program and provides the Agency access to a broad community of researchers whose efforts have significantly improved the scientific foundation for EPA's decision-making process in multiple areas, including the Particulate Matter Program.

EPA's PM program was evaluated for the FY 2005 President's Budget using the Administration's Program Assessment Rating Tool (PART). The Agency is committed to addressing the findings in the PART, such as developing long-term outcome-oriented and annual performance measures, and annual efficiency measures.

Research: Air Toxics

The Agency has developed an Air Toxics Research Strategy[101] that outlines research needs and priorities consistent with programmatic regulatory directions. In addition, the Air Toxics Research Multi-Year Plan (MYP),[102] another tool the Agency uses to plan and implement air toxics research, articulates the chief goals of EPA's air toxics research program as reducing

100 The STAR website can be accessed at: http://es.epa.gov/ncer/grants/ (Accessed January 14, 2004.)

101 U.S. EPA, Office of Research and Development. Air Toxics Research Strategy. Washington, DC: EPA. Accessed October 12, 2003. Available only on the Internet: http://www.epa.gov/ord/htm/Air_Toxics.pdf

102 U.S. EPA, Office of Research and Development. Air Toxics Multi-Year Plan . Washington, DC: EPA. Accessed January 8, 2004. Available only on the Internet: http://www.epa.gov/osp/myp/airtox.pdf

uncertainty in air toxics assessments and providing tools to implement cost-effective approaches to reduce the health risks of exposure to hazardous air pollutants or "HAPs." (Criterion: Quality) Federal, state and local air quality officials will use the results from this research to reduce exposures to HAPs and improve air quality across the country.

In FY 2005, EPA will conduct research to reduce uncertainty in air toxics assessments under both Goals 1 and 4 (in the Human Health Risk Assessment program). Research under Goal 1 to develop an acute risk assessment approach will include the use of animal studies to predict acute neurotoxicity in humans and the identification of model forms common to animals and humans that relate pulmonary and neurobehavioral effects from exposure to hazardous air pollutants. EPA researchers will improve the chronic risk assessment approach by using proteomics to determine common mechanisms of injury within the classes of halogenated organics, metals, aldehydes and ketones, and polycyclic aromatic hydrocarbons.

The Agency will also continue to develop community assessment tools for air toxics. This will include the investigation of acute neurotoxicity, homology between species, and common mechanisms of injury. Research to better understand human exposure to air toxics will be accomplished through the large multidisciplinary study in Detroit, Michigan mentioned above in the description of particulate matter research. The study will develop an improved understanding of the relationship of ambient levels of air toxics to indoor and personal levels and will attempt to identify relative source contributions to personal exposures. (Criterion: Performance)

Research to provide tools to implement cost-effective approaches that reduce the health risks from stationary point, area, mobile, or indoor sources of air toxics will include characterizing sources that contribute to indoor concentrations of air toxics, emissions from small non-road engines, and determining temporal and spatial allocation of truck activity in the Agency's modal-based Mobile Emissions Assessment System for Urban and Regional Evaluation (MEASURE) model. Residual risk assessment and national scale assessment support will include exposure research to prioritize health hazard information, air quality modeling tools to predict ambient concentrations, and an evaluation of methods to measure trace organics (Criterion: Performance).

The Agency will continue its joint effort with industry to support the Health Effects Institute, which sponsors research on the health effects of pollutants from motor vehicles and other sources. Current efforts to more accurately assess exposures to air toxics are developing the foundation for health studies of air toxics using appropriate sites, populations, and endpoints.

As part of the efforts to monitor health and exposures related to the World Trade Center (WTC) disaster, the Agency will support extended follow-up associated with the Agency for Toxic Substances and Disease Registry's (ATSDR) registry of residents and workers affected by the WTC disaster. Currently, a baseline health Registry has been set up. Resources in FY05 will continue to support a multi-agency effort on an additional round of registrant follow-up to get updates on the health status of registrants, and a longitudinal analysis to assist in identifying the nature and extent of long-term health impacts from exposure to the WTC disaster.

FY 2005 CHANGE FROM FY 2004

S&T

- (-$200,600): These resources represent savings that will result from consolidation of many information technology (IT) services, including call center and service desk, server management, hardware and software acquisition, and IT equipment standardization. This will result in enhanced security and uniform maintenance requirements. Since these resources represent an efficiency savings, there is no negative programmatic impact.

- There are additional increases for payroll, cost of living, and enrichment for new and existing FTE.

ANNUAL PERFORMANCE GOALS AND MEASURES

Particulate Matter Research

Long-term Outcome Measusre	Measure under development.
Annual Measure	Measure under development.
Efficiency Measure	Measure under development.

Clean Automotive Technology

In 2005 Transfer hybrid powertrain components, originally developed for passenger car applications, to meet size, performance, durability, and towing requirements of Sport Utility Vehicle and urban delivery vehicle applications with an average fuel economy improvement of 30% over the baseline.

In 2004 Transfer hybrid powertrain components, originally developed for passenger car applications, to meet size, performance, durability, and towing requirements of Sport Utility Vehicle and urban delivery vehicle applications with an average fuel economy improvement of 25% over the baseline.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Fuel Economy of EPA-Developed SUV Hybrid Vehicle over EPA Driving Cycles Tested		25.2	26.3	MPG

Baseline: The average fuel economy of all SUVs sold in the US in 2001 is 20.2 mpg. Values for 2002, 2003, and 2004 represent 15%, 20%, and 25% improvements over this baseline, respectively. The long-term target is to demonstrate a practical and affordable powertrain that is 30% more efficient by 2005, and 100% more efficient by 2010.

Research

PM Measurement Research

In 2005 Deliver and transfer improved receptor models and data on chemical compounds emitted from sources so that, by 2006, EPA's Office of Air and Radiation and the states have the necessary new data and tools to predict, measure, and reduce ambient PM and PM emissions to attain the existing PM National Ambient Air Quality Standards (NAAQS) for the protection of public health.

Performance Measures:	**FY 2003 Actuals**	**FY 2004 Pres. Bud.**	**FY 2005 Pres. Bud.**	
Improved receptor models and data on chemical compounds emitted from sources			09/30/05	models/ data

Baseline: Following designation of non-attainment areas for the Particulate Matter National Ambient Air Quality Standards in 2004 and 2005, states will need to immediately begin developing State Implementation Plans (SIPs). SIPs incorporate source emission reduction rules that once implemented lead to cleaner air and standards attainment. They are due to EPA three years after designation. SIP development is predicated on the availability of recent and credible information on source emission characteristics and receptor-oriented models that can identify sources contributing to locally observed PM concentrations based on their chemical signatures. A next update (FY 2005) of these constantly improving models and the latest in source signatures will be produced to help states with their SIPs as part of a weight of evidence approach that use these and chemical transport modeling to tag specific sources with reduction targets.

Beginning in FY 2005, regular evaluations by independent and external panels will provide reviews of EPA research programs' relevance, quality, and successful performance to date, in accordance with OMB's Investment Criteria for Research and Development. These evaluations will include an examination of a program's design to determine the appropriateness of a program's short-, intermediate-, and long-term goals and its strategy for attaining these. Reviewers will also qualitatively determine whether EPA has been successful in meeting its annual and long-term commitments for research. Recommendations and results from these reviews will improve the design and management of EPA research programs and help to measure their progress under the Government Performance and Results Act (GPRA).

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Performance Measure: Fuel Economy of EPA-Developed SUV Hybrid Vehicle over EPA Driving Cycles Tested

Performance Database: Fuel economy test data for both urban and highway test cycles under the EPA Federal Test Procedure for passenger cars.

Data Source: EPA fuel economy tests performed at the National Vehicle and Fuel Emissions Laboratory (NVFEL), Ann Arbor, Michigan

QA/QC Procedures: EPA fuel economy tests are performed in accordance with the EPA Federal Test Procedure and all applicable QA/QC procedures. Available on the Internet: http://www.epa.gov/otaq/sftp.htm.

Methods, Assumptions and Suitability: N/A

Data Quality Reviews: EPA's NVFEL laboratory is recognized as a national and international facility for fuel economy and emissions testing. NVFEL is also the reference point for private industry.

Data Limitations: Primarily due to EPA regulations, vehicle fuel economy testing is a well established and precise exercise with extremely low test to test variability (well less than 5%). Additional information is available on the Internet: http://www.epa.gov/otaq/testdata.html One challenge relates to fuel economy testing of hybrid vehicles (i.e., more than one source of onboard power), which is more complex than testing of conventional vehicles. EPA has not yet published formal regulations to cover hybrid vehicles. However, relevant information is available on the Internet: http://www.ctts.nrel.gov/analysis/hev_test/procedures.shtml

Error Estimate: N/A

New/Improved Data or Systems: EPA is using solid engineering judgment and consultations with other expert organizations (including major auto companies) to develop internal procedures for testing hybrid vehicles.

References: See http://www.epa.gov/otaq/testproc.htm for additional information about testing and measuring emissions at the NVFEL.

EFFICIENCY MEASURES\MEASUREMENT DEVELOPMENT PLANS

As a measure of efficiency, the Agency will track the time it takes to process particulate matter research grant proposals from RFA closure to submittal to EPA's Grants Administration Division. The Agency will also track the number of peer-reviewed particulate matter research journal articles produced per scientific/engineering FTE.

COORDINATION WITH OTHER AGENCIES

The Agency coordinates its tropospheric ozone research program with other agencies' research efforts, including those of the Departments of Energy and Commerce, and the National Science Foundation. All emissions, atmospheric chemistry, air quality modeling, and monitoring research in this area is coordinated through the efforts of the North American Consortium for Atmospheric Research in Support of Air Quality Management (NARSTO), a public/private partnership whose membership spans governments, utilities, industry, and academia throughout Mexico, the United States, and Canada.

EPA and the National Institutes of Health coordinate research efforts on the health effects of air pollution, recently co-sponsoring a workshop on air pollution and cardiovascular disease. Following this workshop, EPA and the National Institute of Environmental Health Sciences (NIEHS) issued a joint solicitation on the role of air pollutants in cardiovascular disease with the potential to fund approximately 10 - 15 grants ranging from two to four years in duration. EPA,

NIEHS and the National Heart, Lung, and Blood Institute are continuing these successful coordination efforts and discussing possibilities for future collaboration.

The National Research Council's PM research plan serves as the principal guideline for EPA's PM research program. EPA coordinates with other Federal agencies (e.g., the National Institutes of Health and the Department of Energy) to review ongoing PM research activities and, where appropriate, re-focus activities to be consistent with the NAS plan.

The PM science planning community has pointed to the need to conduct its health effects, exposure, and monitoring research in close coordination so that PM toxicological, epidemiological, and exposure research are done in combination. EPA will continue to focus on such coordination through activities such as: (1) playing a lead role in coordinating all Federal agency research on PM health, exposure, and atmospheric processes under the Air Quality Research Subcommittee of the President's Committee on Environment and Natural Resources (CENR/AQRS); (2) supporting an open inventory of public and private ongoing PM research; and (3) completing a Research Strategy for PM that will benefit all organizations engaged in PM-related research. Another key opportunity for coordinating research supporting state efforts to implement the PM NAAQS is through the expansion of NARSTO, which has broadened its mission to include PM-related efforts.

EPA's Air Toxics Research Program works with other Federal agencies, such as the National Institute of Environmental Health Sciences (NIEHS) and the National Toxicology Program (as a source of toxicity testing data), as needed. The Health Effects Institute conducts complementary research related to air toxics that is coordinated with EPA activities. In addition, EPA conducts research on advanced source measurement approaches jointly with the Department of Defense through the Strategic Environmental Research and Development Program (SERDP).

EPA works with the National Park Service in running CASTNET. DOE will pursue actions such as promoting the research, development, and deployment of advanced technologies (for example, renewable energy sources). In the case of fuel cell vehicle technology, EPA is working closely with DOE as the Administration's FreedomCAR initiative develops, taking the lead on emissions-related issues.

STATUTORY AUTHORITIES

Clean Air Act Amendments
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)
Energy Policy Act of 1992
Federal Technology Transfer Act, 15 U.S.C. – Section 3701a
Global Climate Protection Act, 15 U.S.C. 2901 – Section 1103
National Climate Program Act (1997)
Nuclear Waste Policy Act of 1982
Pollution Prevention Act, 42 U.S.C. 13101 et seq. - Sections 6602, 6603, 6604, and 6605
Safe Drinking Water Act
U.S. Global Change Research Program Act of 1990

United Nations Framework Convention on Climate Change
Uranium Mill Tailings Radiation Control Act of 1978
Waste Isolation Pilot Plan (WIPP) Land Withdrawal Act

Environmental Protection Agency

FY 2005 Annual Performance Plan and Congressional Justification

CLEAN AIR AND GLOBAL CLIMATE CHANGE