

1. Voluntary Reporting 2003: An Overview

Introduction

The Energy Policy Act of 1992 (EPACT) directed the U.S. Department of Energy (DOE), with the Energy Information Administration (EIA) as the implementing agency, to develop a program to document voluntary actions that reduce emissions of greenhouse gases or remove greenhouse gases from the atmosphere (see box on page 2).¹ DOE's Office of Policy and International Affairs developed the Guidelines to the Voluntary Reporting of Greenhouse Gases Program² in consultation with the U.S. Environmental Protection Agency (EPA) and other Federal agencies, as well as through a public comment process. In addition to providing recognition for entities that reduce greenhouse gas emissions or sequester carbon voluntarily, the program serves to identify innovative and effective ways of reducing emissions.

This report presents information on the tenth reporting cycle of the Voluntary Reporting Program, including reported information on emissions, emission reductions, and carbon sequestration activities through 2003. The report is divided into eight chapters. This chapter provides an overview of participation in the Voluntary Reporting Program, a perspective on the composition of activities reported, and a review of some key issues in interpreting and evaluating achievements associated with reported emission mitigation initiatives.

Chapters 2 through 6 provide a more detailed review of project-level emission reduction initiatives reported to the Program. Chapter 2 examines projects in the electricity sector that reduce carbon dioxide emissions through thermal efficiency improvements or switching to lower emitting fossil fuels. Chapter 3 considers improvements in end-use efficiency and fuel switching in the residential, commercial, industrial, and transportation sectors. Activities to improve or expand carbon sinks through such activities as reforestation, afforestation, and forest preservation are the subject of Chapter 4. Emission reduction initiatives associated with methane and

halogenated substances are examined in Chapters 5 and 6, respectively.

Chapter 7 reviews emissions reports from participants who provided data on aggregate entity emissions. Chapter 8 summarizes information on emission reductions and carbon sequestration projects reported in brief on the short form (Form EIA-1605EZ). Appendixes A and B provide information on the development and structure of the data collection instrument, a discussion of issues in the interpretation of the data, and tabular summaries of the participating reporters and the information they reported.

The reports submitted to EIA are compiled into a database that can be obtained on CD-ROM by contacting the Voluntary Reporting of Greenhouse Gases Program Communications Center at 1-800-803-5182 or downloaded from EIA's web site at www.eia.doe.gov/oiaf/1605/databases.html.

Benefits of the Voluntary Reporting Program

The Voluntary Reporting Program is unique among the many voluntary programs initiated during the early 1990s in its diversity of project types, participation, and approaches. The Voluntary Reporting Program's database provides abundant examples of the types of concrete actions that organizations can undertake to reduce greenhouse gas emissions. Some of the most important societal benefits of the Voluntary Reporting Program are:³

- The program has served to teach staff at many of the largest corporations in the United States how to estimate greenhouse gas emissions and has educated them on a range of possible measures to limit emissions.

¹Title XVI of the Energy Policy Act, Public Law 102-486 (October 24, 1992), in Section 1605(a) called for an annual report on national aggregate emissions of greenhouse gases. EIA has issued the report—*Emissions of Greenhouse Gases in the United States*—every year since 1993. Section 1605(b) called for the establishment of a database of annual emissions and reductions of emissions reported on a voluntary basis.

²See U.S. Department of Energy, *General Guidelines to the Voluntary Reporting of Greenhouse Gases Program*, and, *Sector-Specific Issues and Reporting Methodologies Supporting the General Guidelines for the Voluntary Reporting of Greenhouse Gases* (Washington, DC 1994), web site www.eia.doe.gov/oiaf/1605/guidelns.html.

³Testimony of Jay Hakes, former EIA Administrator, on March 30, 2000, before the Senate Committee on Energy and Natural Resources on Senate Bills S. 882 and S. 1776 and their potential impacts on EIA's Programs. The full text of the testimony is available on EIA's web site at www.eia.doe.gov/neic/speeches/hrtest3-30-00/testimony3.htm.

- The program has helped to provide concrete evidence for the evaluation of activities reported to the many government voluntary programs launched since 1993.
- Reporters have been able to learn about innovative emission reduction activities from the experiences of their peers.
- The program has created a “test” database of approaches to emission reductions that can be used to evaluate future policy instruments aimed at limiting emissions.
- The program has helped to illuminate many of the poorly appreciated emissions accounting issues that must be addressed in designing any future approaches to emission limitations.

Who Reported?

Reports for the 2003 data year were received from 234 participants in 27 different industries or services (defined by the two-digit Standard Industrial Classification code), a decrease from the 29 different industries represented among 2002 reporters. In comparison, reports for the 1994 data year—the first year of the program—were received from 108 participants in 9 different industries or services (Table 1).

In the early years of the program, reporting was dominated by the electric power sector. In the first reporting year (data year 1994), the 95 submissions from electric power producers represented 88 percent of the 108 reports received (Figure 1). Since then, the program has seen an influx of new participants from outside the

The Energy Policy Act of 1992, Sections 1605(b) and (c)

(b) Voluntary Reporting.—

(1) ISSUANCE OF GUIDELINES.—Not later than 18 months after the date of the enactment of this Act, the Secretary shall, after opportunity for public comment, issue guidelines for the voluntary collection and reporting of information on sources of greenhouse gases. Such guidelines shall establish procedures for the accurate voluntary reporting of information on—

(A) greenhouse gas emissions—

- (i) for the baseline period of 1987 through 1990; and
- (ii) for subsequent calendar years on an annual basis;

(B) annual reductions of greenhouse gas emissions and carbon fixation achieved through any measures, including fuel switching, forest management practices, tree planting, use of renewable energy, manufacture or use of vehicles with reduced greenhouse gas emissions, appliance efficiency, methane recovery, cogeneration, chlorofluorocarbon capture and replacement, and power plant heat rate improvement;

(C) reductions in greenhouse gas emissions achieved as a result of—

- (i) voluntary reductions;
- (ii) plant or facility closings; and
- (iii) State or Federal requirements; and

(D) an aggregate calculation of greenhouse gas emissions by each reporting entity.

Such guidelines shall also establish procedures for taking into account the differential radiative activity and atmospheric lifetimes of each greenhouse gas.

(2) REPORTING PROCEDURES.—The Administrator of the Energy Information Administration shall develop forms for voluntary reporting under the guidelines established under paragraph (1), and shall make such forms available to entities wishing to report such information. Persons reporting under this subsection shall certify the accuracy of the information reported.

(3) CONFIDENTIALITY.—Trade secret and commercial or financial information that is privileged or confidential shall be protected as provided in section 552(b)(4) of title 5, United States Code.

(4) ESTABLISHMENT OF DATA BASE.—Not later than 18 months after the date of the enactment of this Act, the Secretary through the Administrator of the Energy Information Administration shall establish a data base comprised of information voluntarily reported under this subsection. Such information may be used by the reporting entity to demonstrate achieved reductions of greenhouse gases.

(c) Consultation.—

In carrying out this section, the Secretary shall consult, as appropriate, with the Administrator of the Environmental Protection Agency.

Table 1. Forms Filed by Standard Industrial Classification, Data Years 1994-2003
(Number of Reports)

SIC Code ^a	Description	Data Year									
		1994	1995	1996	1997	1998	1999	2000 ^(R)	2001 ^(R)	2002 ^(R)	2003
01	Agricultural Production: Crops	0	0	0	0	1	0	0	1	0	0
08	Forestry	1	2	1	1	3	3	1	0	1	2
12	Coal Mining	1	2	2	1	4	4	4	6	7	4
13	Oil and Gas Extraction	0	0	0	0	0	1	1	1	1	1
14	Nonmetallic Minerals, Except Fuels	0	0	0	0	1	1	0	0	0	0
20	Food and Kindred Products	0	0	0	0	1	2	6	4	4	4
22	Textile Mill Products	0	0	0	0	0	1	5	11	12	14
23	Apparel and Other Textile Products	0	0	0	0	0	0	1	1	2	2
24	Lumber and Wood Products	0	0	0	0	0	0	1	1	0	0
25	Furniture and Fixtures	0	0	0	0	0	0	1	1	1	0
26	Paper and Allied Products	0	0	0	0	0	1	1	0	0	0
27	Printing and Publishing	0	1	0	1	0	1	1	0	0	0
28	Chemicals and Allied Products	1	3	2	3	8	5	11	9	11	11
29	Petroleum Refining and Other Related Industries	0	0	2	3	8	8	7	6	6	5
30	Rubber and Miscellaneous Plastic Products	0	0	0	0	0	0	2	2	2	2
32	Stone, Clay, Glass, and Concrete Products	0	0	2	4	12	13	7	5	5	5
33	Primary Metals Industries	2	2	4	4	5	5	5	11	11	11
34	Fabricated Metal Products, Except Machinery and Transportation Equipment	0	2	1	1	4	2	2	1	1	1
35	Industrial and Commercial Equipment and Components	0	0	0	0	0	0	1	1	1	2
36	Electronic and Other Electrical Equipment	1	1	2	4	4	4	9	9	8	6
37	Transportation Equipment	1	1	1	2	3	5	6	7	9	10
38	Instruments and Related Products	0	0	0	0	2	0	1	1	1	1
39	Miscellaneous Manufacturing Industries		1	1	0	2	2	1	1	1	1
40	Railroad Transportation	0	0	0	0	0	0	0	0	0	1
48	Communications	0	0	0	0	0	1	0	0	1	1
49	Electric, Gas, and Sanitary Services	98	123	125	129	138	135	151	145	138	141
57	Furniture and Home Furnishings Stores	0	0	0	0	2	1	1	0	1	1
63	Insurance Carriers	0	0	0	0	0	0	0	0	0	1
65	Real Estate	0	1	1	1	1	1	1	1	1	0
67	Holding and Other Investment Offices	0	0	1	1	1	1	1	1	2	2
72	Personal Services	0	0	0	0	0	0	1	1	1	1
80	Health Services	0	0	0	0	1	0	0	0	0	0
82	Educational Services	1	2	2	2	0	2	0	0	0	0
86	Membership Organizations	0	0	0	1	1	1	1	0	1	0
87	Engineering and Management Services	0	0	2	2	2	1	0	1	0	0
88	Private Households	2	1	1	1	1	1	1	1	1	1
89	Services Not Elsewhere Classified	0	0	0	1	1	3	2	1	1	1
91	Executive, Legislative, and General	0	0	0	0	1	2	2	2	1	1
97	National Security and International Affairs	0	0	0	0	0	0	1	0	0	0
99	Nonclassifiable Establishments	0	0	0	0	0	0	0	0	1	0
Total Number of Reporters^b		108	142	150	162	207	207	236	232	234^c	234
Number of 2-Digit SIC Codes Represented		9	13	16	18	24	27	31	27	29^c	27

^aThe Voluntary Reporting of Greenhouse Gases database was designed in 1994-1995, when the Standard Industrial Classification (SIC) system was still in use.

^bTotals may be greater than the sum of reporters in each SIC code, because confidential reporters are excluded from the latter.

^cIncludes 6 late reports for the 2002 data year. The 2003 total will also be revised upward in next year's report with the inclusion of late 2003 reports. As of February 22, 2005, EIA had received 6 late 2003 reports, which are not included in this report's 2003 database.

(R) = Revised.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

electric power sector, representing a diverse set of industries. In addition, several mergers and acquisitions involving reporters to the program have reduced the number of reports received from electricity producers. As a result, only 42 percent of the organizations reporting to the program for data year 2003 were from the electric power sector.

Although the number of reporters from other individual industries remained relatively small, in many cases, reports were received from key companies in those other industries: for example, General Motors, Ford Motor Company, DaimlerChrysler Corporation, Nissan North America, Inc., and Toyota Motor North America, Inc., in the automotive products industry; Noranda and an operating division of Alcan in the metals industry; BP America, Sunoco, Inc., and ChevronTexaco Corporation in the petroleum industry; Johnson & Johnson and The Dow Chemical Company in the chemicals industry; Rolls Royce in the aerospace industry; Bristol-Myers Squibb Company and Pfizer Pharmaceuticals, LLC, in the pharmaceuticals industry; and Advanced Micro Devices, Inc., and IBM in the electronic equipment industry. A complete listing of all 2003 reporters is provided in Appendix B, Table B1.

Most reporters indicated that their projects were affiliated with one or more government-sponsored voluntary programs. Of the 2,188 projects reported for 2003, 1,066 were affiliated with the DOE's Climate Challenge Program, 381 with the EPA's Landfill Methane Outreach Program, 94 with the various DOE/EPA ENERGY STAR⁴ programs (including ENERGY STAR Buildings, ENERGY STAR Computers, and ENERGY STAR Transformers), 50 with the EPA's Climate Wise Recognition Program, 39 with the U.S. Initiative on Joint Implementation, 23 with the EPA's Natural Gas STAR Program, 16 with the EPA's Green Lights Program, 11 with the EPA's Sulfur Hexafluoride Emissions Reduction Partnership, 9 with the EPA's WasteWise, 7 with DOE's Compressed Air Challenge, and 6 with the EPA's Coalbed Methane Outreach Program. Other voluntary programs cited included the EPA's Voluntary Aluminum Industrial Partnership and DOE's Motor Challenge, Rebuild America, and Cool Communities Program. Not all participants in the various voluntary programs provided information to the Voluntary Reporting Program.

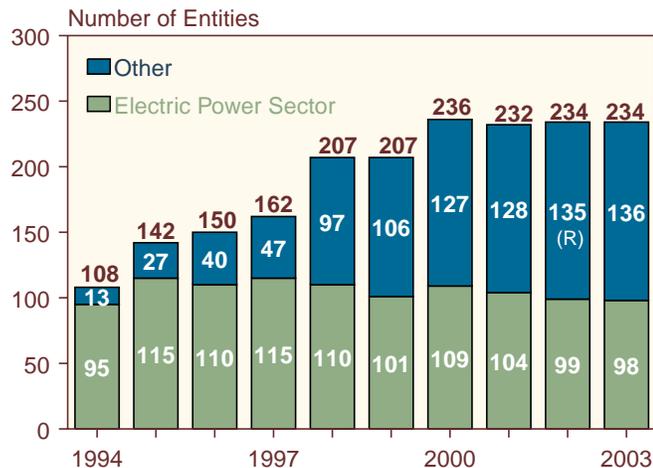
What Was Reported?

The Voluntary Reporting Program permits three distinct types of reporting:

- Project-level reporting, defined as the reporting on the emission reductions or carbon sequestration achieved as a result of a specific action or group of actions
- Entity-level reporting, defined as the reporting on emissions, emission reductions, and carbon sequestration for of an entire organization, usually defined as a corporation
- Commitments to take action to reduce emissions in the future.

Of the 234 reports received for 2003, 200 (85 percent) were submitted on Form EIA-1605 (the long form) (Figure 2). The long form allows reporters to create an in-depth, multi-year, public record of emission reduction efforts for an entire organization and/or at the project level, including information on activities conducted outside the United States and commitments to reduce future greenhouse gas emissions. The remaining reports were submitted on Form EIA-1605EZ (the short form), which allows reporters only to provide brief summaries of greenhouse gas projects for the current reporting year and does not allow the reporting of activities outside the United States or of future emission reduction commitments. The proportion of reporters using the short form

Figure 1. Electric Power Sector and Other Entities Submitting Reports to the Voluntary Reporting of Greenhouse Gases Program, Data Years 1994-2003



(R) = revised.

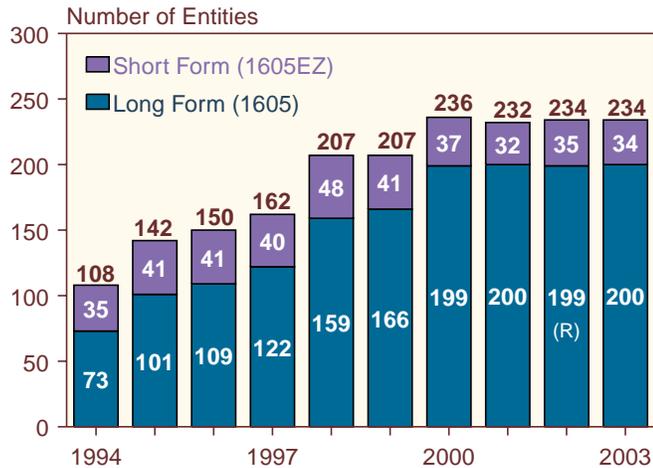
Notes: Electric power sector includes electric utilities and independent power producers. 2002 data year includes 6 late reports that were not included in the totals presented in last year's annual report and database.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

⁴ENERGY STAR is a joint program of the U.S. Department of Energy and the U.S. Environmental Protection Agency. See web site www.energystar.gov.

has declined from 32 percent in the first year of the program (1994 data year) to 15 percent in the 2003 data reporting cycle. EIA believes that reporters are choosing the long form in order to document their emission reductions more thoroughly. Also, for the same reason,

Figure 2. Number of Reports Received by Form Type, Data Years 1994-2003



(R) = revised.

Notes: Electric power sector includes electric utilities and independent power producers. 2002 data year includes 6 late reports that were not included in the totals presented in last year's annual report and database.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

several voluntary programs (such as the Landfill Methane Outreach Program) encourage participants to use the long form.

For the 2003 reporting year, 177 program participants (76 percent of the total) reported project-level reductions, and 126 reported entity-level emissions and/or reductions: 70 reported at both the entity and project levels, 107 submitted only project-level reports, and 57 reported only entity-level information. In addition, 89 reporters provided information on their commitments to reduce emissions or increase sequestration in the future, including one program participant that reported only commitments without reporting on past activities.

Sources of greenhouse gas emissions and emission reductions reported to the Voluntary Reporting Program are characterized as direct, indirect, sequestration, or unspecified. The unspecified category includes all reductions and sequestration reported on the short form because the short form does not allow a reporting entity to specify whether an emission reduction is direct or indirect. Because of concern about possible double counting of emissions and reductions, particularly between direct and indirect emissions, EIA does not aggregate reported emissions or emission reductions across these four categories.

Project Level

Reporters provided information on a total of 2,188 projects for 2003 (Table 2). Most (1,969 or 90 percent) were

Table 2. Distribution of Projects by Reduction Objective, Project Type, and Form Type, Data Year 2003

Reduction Objective and Project Type	Number of Projects			Number of Reporters		
	Long Form	Short Form	Total	Long Form	Short Form	Total
Reducing Carbon Dioxide Emissions	925	136	1,061	93	29	122
Electricity Generation, Transmission, and Distribution	464	50	514	68	23	91
Cogeneration and Waste Heat Recovery	21	0	21	13	0	13
Energy End Use	374	76	450	67	20	87
Transportation and Offroad Vehicles	66	10	76	35	6	41
Reducing Methane and Nitrous Oxide Emissions	470	44	514	71	6	77
Waste Treatment and Disposal (Methane)	425	42	467	54	5	59
Agriculture (Methane and Nitrous Oxide)	4	0	4	3	0	3
Oil and Natural Gas Systems and Coal Mining (Methane)	41	2	43	22	2	24
Carbon Sequestration	446	14	460	51	12	63
Halogenated Substances	43	1	44	29	1	30
Other Emission Reduction Projects	85	24	109	46	10	56
Entity-Level Reporting Only (No Projects)	NA	NA	NA	57	NA	57
Commitment Reporting Only (No Projects or Entity-Level Data)	NA	NA	NA	0	NA	0
Total	1,969	219	2,188	200	34	234

NA = not applicable.

Notes: The total number of reporters is smaller than the sum of the number of reporters for each project type, because most reporters provided information on more than one project. Table excludes projects submitted in confidential reports.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

reported on the long form. The total number of projects reported increased by 133, or 6 percent, compared with the previous reporting cycle.⁵ Most of the 2,188 projects reported for 2003 were also among the 2,055 projects reported for 2002, because they continued to yield emission reductions in 2003. Projects often yield emission reductions over an extended period; for example, an availability improvement project at a nuclear power plant typically involves the adoption of new maintenance and refueling programs that, once in place, are followed over a multi-year period. Likewise, the reforestation of an area in one year can result in the sequestration of carbon in many subsequent years, even if no additional trees are planted. Reporters continue to report the annual emission reductions and carbon sequestration achieved by such long-lived projects on a yearly basis.

The principal objective of the majority of projects (1,061 or 48 percent) reported for 2003 was to reduce carbon dioxide emissions (Table 2). Most reduced carbon dioxide either by reducing fossil fuel consumption or by switching to lower emitting sources of energy. Many also achieved small reductions in emissions of other gases. Other project objectives cited included reducing methane and nitrous oxide emissions (514 or 23 percent), increasing carbon sequestration (460 or 21 percent), and reducing emissions of halogenated substances (44 or 2 percent). Projects that also primarily reduced carbon dioxide emissions included the 109 "other" emission reduction projects, most of which involved either the reuse of fly ash as a cement substitute in concrete or the recycling of waste materials.

Most projects involve actions within the United States; however, some are conducted in foreign countries, designed to test various concepts of joint implementation with other nations (Table 3). Of the 94 foreign projects reported for 2003, 60 represented shares in two forestry programs in Belize and Malaysia sponsored by the electric power industry.

Total project-level emission reductions reported included 268.3 million metric tons carbon dioxide equivalent in direct reductions, 81.1 million metric tons carbon dioxide equivalent in indirect reductions, 7.7 million metric tons carbon dioxide equivalent in carbon sequestration, and 16.4 million metric tons carbon dioxide equivalent in unspecified reductions (Table 4). EIA uses global warming potentials (GWPs) from the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) to calculate carbon dioxide equivalents (see box on page 7).

Projects whose reduction objective was to reduce carbon dioxide emissions reported direct reductions of 193.1 million metric tons carbon dioxide equivalent, indirect reductions of 39.0 million metric tons carbon dioxide equivalent, and unspecified reductions of 12.4 million metric tons carbon dioxide equivalent. The vast majority of the reported emission reductions were carbon dioxide reductions.

A variety of efforts to reduce emissions of gases with high GWPs were also reported, including 514 projects with the objective of reducing methane and nitrous oxide emissions. These projects focused on waste

Table 3. Geographic Scope of Reports Received and Location of Emission Reduction Projects, Data Years 1994-2003

Year	Reports Received					Projects Reported ^b			
	U.S. Only		Foreign Only	Both U.S. and Foreign	Total ^a	U.S. Only		Foreign Only	Total ^a
	Long Form	Short Form				Long Form	Short Form		
1994	65	34	2	4	108	500	125	9	634
1995	82	40	2	16	142	760	164	36	960
1996	83	41	1	24	150	828	179	33	1,040
1997	90	40	1	31	162	1,017	201	70	1,288
1998	118	47	1	40	207	1,212	252	85	1,549
1999	125	39	4	37	207	1,397	237	87	1,721
2000	153	36	1	45	236	1,761	229	99	2,089
2001	155	32	1	43	232	1,596	210	91	1,897
2002 ^(R)	156	35	3	39	234	1,708	253	94	2,055
2003	157	34	2	40	234	1,873	219	96	2,188

^aTotals are greater than the sum of the components because the latter exclude information from confidential reports.

^bExcludes projects submitted in confidential reports.

(R) = revised.

Notes: The number of reports received for 2002 was revised to reflect the receipt of 6 reports after the finalization of the Public Use Database for last year's annual report. The number of projects reported for 2002 has also been revised to reflect the projects included in those reports.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

⁵The total number of projects reported for 2002 has increased from 2,027 to 2,055 with the receipt of 6 additional reports after the database used to prepare the annual report and Public Use Database for 2002 was finalized. See note to Table 3.

management systems, animal husbandry operations, oil and gas systems, or coal mines. Reported net direct emission reductions from these projects totaled 68.6 million metric tons carbon dioxide equivalent, which represents 26 percent of the total direct reductions reported for 2003. The estimate of net reductions includes 76.6 million metric tons carbon dioxide equivalent in direct reductions of methane emissions along with 8.0 million metric tons carbon dioxide equivalent in carbon dioxide and nitrous oxide emissions increases. Indirect reductions reported for projects that reduced methane and nitrous oxide emissions totaled 39.8 million metric tons carbon dioxide equivalent. Unspecified reductions reported on the short form totaled 3.9 million metric tons carbon dioxide equivalent.

Almost all of the 460 carbon sequestration projects reported on either the long form or the short form increased the amount of carbon stored in sinks through various forestry measures, including afforestation, reforestation, urban forestry, forest preservation, and

modified forest management techniques. These activities accounted for 21 percent of the projects reported for 2003; however, 284 of the reported carbon sequestration projects represented shares in 10 projects conducted by the UtiliTree Carbon Company, which were reported by 28 participating electric utilities. Carbon sequestration projects reported on the long form for 2003 totaled 7.7 million metric tons carbon dioxide equivalent in carbon sequestration achieved.

Projects with the objective of reducing emissions of halogenated substances—including perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and hydrofluorocarbons (HFCs)—reported direct reductions of 6.1 million metric tons carbon dioxide equivalent for 2003, which included 3.5 million metric tons carbon dioxide equivalent of PFC emissions and 2.6 million metric tons carbon dioxide equivalent of SF₆ emissions, as well as indirect reductions of 2.2 million metric tons carbon dioxide equivalent, the vast majority of which was SF₆.

Global Warming Potentials Used to Calculate Carbon Dioxide Equivalent Emissions

Global warming potentials (GWPs) are used to compare the abilities of different greenhouse gases to trap heat in the atmosphere. GWPs are based on the radiative efficiency (heat-absorbing ability) of each gas relative to that of carbon dioxide (CO₂), as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years) relative to that of CO₂. The GWP provides a construct for converting emissions of various gases into a common measure, which allows climate analysts to aggregate the radiative impacts of various greenhouse gases into a uniform measure denominated in carbon or carbon dioxide equivalents. The table at the right presents the GWPs published in the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

In analyzing greenhouse gas emissions and emission reductions reported to the Voluntary Reporting of Greenhouse Gases Program, EIA attempts to employ the most current data sources. For that reason, and because the IPCC is generally considered the authoritative source for GWPs, EIA uses the IPCC's most recent GWP values, from the Third Assessment Report, to convert reported greenhouse gas emissions to the carbon dioxide equivalent units used in this report. It is important to point out, however, that countries reporting to the United Nations Framework Convention on Climate Change (UNFCCC), including the United States, have been compiling estimates based on the GWPs from the IPCC's Second Assessment Report.

The UNFCCC Guidelines on Reporting and Review, adopted before the publication of the Third Assessment Report, require emission estimates to be based on the GWPs in the IPCC Second Assessment Report. This will probably continue in the short term, until the UNFCCC reporting rules are changed.

100-Year GWP Estimates from the IPCC's Third (2001) Assessment Reports

Gas	2001 IPCC GWP ^a
Methane	23
Nitrous Oxide	296
HFC-23	12,000
HFC-32	550
HFC-125	3,400
HFC-134a	1,300
HFC-143a	4,300
HFC-152a	120
HFC-227ea	3,500
HFC-236fa	9,400
Perfluoromethane (CF ₄)	5,700
Perfluoroethane (C ₂ F ₆)	11,900
Perfluoropropane (C ₃ F ₈)	11,900
Sulfur Hexafluoride (SF ₆)	22,200

^aIntergovernmental Panel on Climate Change, *Climate Change 2001: The Scientific Basis. Summary for Policymakers* (Cambridge, UK: Cambridge University Press, 2001).

Table 4. Summary of Reported Project-Level Emission Reductions and Carbon Sequestration by Reduction Objective and Gas, Data Year 2003
(Metric Tons Carbon Dioxide Equivalent)

Gas	Reductions by Project Objective				Total Reductions
	Reduce Carbon Dioxide Emissions	Reduce Methane and Nitrous Oxide Emissions	Increase Carbon Sequestration	Reduce Emissions of Halogenated Substances	
Direct					
Carbon Dioxide	193,113,253	-7,975,336 ^a	1,932	—	185,139,849
Methane	347,122	76,645,627	—	—	76,992,749
Nitrous Oxide	32,778	-23,899 ^a	—	—	8,879
HFCs	—	—	—	—	0
PFCs	25,536	—	—	3,524,969	3,550,504
SF ₆	—	—	—	2,611,910	2,611,910
Total Direct	193,518,689	68,646,392	1,932	6,136,879	268,303,892
Indirect					
Carbon Dioxide	38,461,582	16,977,303	—	—	55,438,884
Methane	264,381	22,737,072	—	—	23,001,453
Nitrous Oxide	56,049	121,374	—	—	177,423
HFCs	—	—	—	38,702	38,702
PFCs	236,823	—	—	567	237,390
SF ₆	—	—	—	2,184,750	2,184,750
Total Indirect	39,018,835	39,835,749	—	2,224,018	81,078,602
Sequestration					
Carbon Dioxide	—	—	7,730,969	—	7,730,969
Methane	—	—	—	—	—
Nitrous Oxide	—	—	—	—	—
HFCs	—	—	—	—	—
PFCs	—	—	—	—	—
SF ₆	—	—	—	—	—
Total Sequestration	—	—	7,730,969	—	7,730,969
Unspecified^b					
Carbon Dioxide	12,427,175	39,057	28,576	—	12,494,809
Methane	21,456	3,813,915	—	—	3,835,371
Nitrous Oxide	—	—	—	—	—
HFCs	—	—	—	—	—
PFCs	1,910	—	—	—	1,910
SF ₆	22,154	—	—	6,495	28,649
Total Unspecified	12,472,694	3,852,972	28,576	6,495	16,360,738

^aNegative reductions represent increases in emissions.

^bUnspecified emission reductions represent quantities reported on the short form (Form EIA-1605EZ), where reporters are not asked to specify whether the emission reduction or sequestration is direct or indirect.

Notes: CFCs, HCFCs, and methyl chloroform are not included in the totals because of the uncertainty associated with estimates of net global warming potential for these gases. Their direct warming effects (radiative forcing) are offset by indirect cooling effects (destruction of stratospheric ozone, another greenhouse gas). Direct, indirect, and unspecified emission reductions and sequestration have not been totaled to avoid double counting of reductions or sequestration that have been reported by more than one entity.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

Total direct emission reductions reported for 2003 increased by 1 percent over the reductions reported for 2002, to 268.3 million metric tons carbon dioxide equivalent (Table 5), and have quadrupled since the first year of the program (data year 1994). Reported direct reductions of carbon dioxide emission increased by 6.7 million metric tons, while direct reductions of methane emissions decreased by 3.1 million metric tons.

Indirect emission reductions reported for 2003, at 81 million metric tons carbon dioxide equivalent, were 1.0 million metric tons carbon dioxide equivalent (1.2 percent) higher than those reported for 2002. Largely responsible for the increase was a new reporter, Xenon Specialty Gas, which reported indirect reductions of SF₆ emissions equal to 2.2 million metric tons carbon dioxide equivalent.

Reported sequestration, after peaking at 12.5 million metric tons carbon dioxide equivalent for 1998, has fallen below 10 million metric tons carbon dioxide for the past 5 years. This decline was caused by the decline in, or nonrecurrence of, sequestration reported for several large forest preservation projects. Also, American Forests, which reported sequestration for 164 reforestation projects for 2000, has not reported for subsequent years. Unspecified reductions reported for 2003, which include reductions and sequestration reported on the short form, totaled 16.4 million metric tons carbon dioxide equivalent, a decrease of 5.2 percent from 2002.

Project-Level Reference Cases

Beginning with the 2000 annual report, EIA began dividing project-level data according to the reference case employed in calculating reported project-specific emission reductions. A “reference case” is an emissions or sequestration level against which actual emissions are compared to estimate emission reductions. In a “basic” reference case, actual historical emissions (or sequestration) in a specific year, or an average of a range of years, are used as the reference case. In a “modified” reference case, an estimate is made of what emissions or sequestration would have been in the absence of the project, and that estimate serves as the reference case.

Of the projects reported for 2003 on Form EIA-1605, 95 percent used modified reference cases (Table 6). A modified reference case is generally preferred for project-level analysis, because this approach attempts to isolate the effect of the action taken by the reporter from other factors that may have affected the reporter’s emissions since the action was taken. The use of basic reference cases for 2003 was greatest for projects that reported reducing emissions of halogenated substances (42 percent of those projects), because the techniques for evaluating reductions for the projects are particularly suited to the use of a basic reference case. Emissions are

determined using inventory management data, with emissions of a particular substance being equal to the amount purchased during the year to replace quantities emitted. Annual reductions can be calculated by subtracting the emissions in the years after emission abatement measures have been instituted from the emissions in the year before the measures were instituted.

In terms of emission reductions and sequestration reported for 2003, 261 million metric tons carbon dioxide equivalent in direct reductions (97 percent of total direct reductions), 74.8 million metric tons carbon dioxide equivalent in indirect reductions (92 percent of total indirect reductions), and 7.8 million metric tons carbon dioxide equivalent in sequestration (94 percent of total sequestration) were reported as having been estimated using modified reference cases (Table 7). The halogenated substance category was the only project category for which a significant proportion (92 percent or 5.6 million metric tons carbon dioxide equivalent) of the reported direct reductions was estimated using a basic reference case.

Entity Level

Most of the 126 reporters providing entity-level information included data on emissions as well as emission reductions or sequestration. In addition, 9 reporters provided entity-level data on emissions only, and 6 reporters provided entity-level data on emission reductions or sequestration only.

Total entity-level direct emissions reported for 2003 were 888.8 million metric tons, representing a 0.1-percent decrease from the direct emissions reported for 2002 (Table 8). Total entity-level indirect emissions reported for 2003 were 6 percent lower than those reported for 2002, at 104.7 million metric tons carbon dioxide equivalent. Total direct emission reductions reported at the entity level for 2003 (214.2 million metric tons carbon dioxide equivalent) were 8 percent lower than those reported for 2002 (231.6 million metric tons carbon dioxide equivalent). For 2003, 182.4 million metric tons carbon dioxide equivalent (85 percent) of the reported direct reductions were estimated using modified reference cases, and 31.8 million metric tons carbon dioxide equivalent (15 percent) were estimated with basic reference cases.

Reported entity-level indirect emission reductions for 2003 totaled 42.6 million metric tons carbon dioxide equivalent, 19 percent higher than the total reported for 2002. Reported indirect reductions of 45.6 million metric tons carbon dioxide equivalent calculated with modified reference cases were offset by -3.2 million metric tons carbon dioxide equivalent of indirect reductions (i.e., a net increase in emissions) calculated with basic reference cases. Entity-level sequestration reported for 2003

Table 5. Summary of Reported Project-Level Emission Reductions and Carbon Sequestration by Gas, Data Years 1994-2003
(Metric Tons Carbon Dioxide Equivalent)

Year	Carbon Dioxide	Methane	Nitrous Oxide	HFCs	PFCs	Sulfur Hexafluoride	Total
Direct							
1994	58,413,709	576,808	339,485	-29	3,199,649	83,579	62,613,201
1995	85,419,479	194,350	-438,673	-43	2,962,416	186,382	88,323,910
1996	77,601,577	9,411,042	-423,599	15,193	3,345,811	-69,985	89,880,039
1997	82,269,887	8,705,355	86,294	-42	3,318,600	516,732	94,896,824
1998	112,038,605	31,720,732	109,560	-1,738	3,504,380	624,786	147,996,326
1999	115,366,719	35,994,030	62,111	-1,738	3,425,480	595,379	155,441,981
2000	144,096,233	61,945,794	114,198	—	3,233,612	1,407,347	210,797,186
2001	159,129,312	81,569,042	711,633	—	3,606,813	2,475,144	247,491,944
2002 ^(R) . . .	178,393,155	80,073,702	-4,713	—	3,562,893	3,043,682	265,068,719
2003	185,139,849	76,992,749	8,879	—	3,550,504	2,611,910	268,303,892
Indirect							
1994	2,994,405	2,360,734	2,243	—	—	—	5,357,381
1995	27,063,660	24,777,246	630,358	—	—	7,653	52,478,917
1996	26,207,709	26,612,114	616,075	—	—	—	53,435,898
1997	25,848,951	11,630,239	102,639	—	3,631	81	37,585,541
1998	27,968,865	15,152,664	105,598	—	6,068	81	43,233,274
1999	37,233,635	19,027,769	270,531	—	5,856	81	56,537,872
2000	41,276,444	20,641,700	115,689	—	35,459	81	62,069,372
2001	48,255,932	23,216,197	154,566	—	34,319	81	71,661,094
2002 ^(R) . . .	55,347,688	24,555,786	164,214	47	36,705	81	80,104,520
2003	55,438,884	23,001,453	177,423	38,702	237,390	2,184,750	81,078,602
Sequestration							
1994	746,545	—	—	—	—	—	746,545
1995	1,190,754	—	—	—	—	—	1,190,754
1996	8,676,591	—	—	—	—	—	8,676,591
1997	9,849,807	—	—	—	—	—	9,849,807
1998	12,490,927	—	—	—	—	—	12,490,927
1999	9,623,599	—	—	—	—	—	9,623,599
2000	9,011,117	—	—	—	—	—	9,011,117
2001	7,956,823	—	—	—	—	—	7,956,823
2002 ^(R) . . .	7,296,516	—	—	—	—	—	7,296,516
2003	7,730,969	—	—	—	—	—	7,730,969
Unspecified^a							
1994	3,721,047	564,022	—	—	—	—	4,285,069
1995	4,959,366	1,162,752	—	—	—	—	6,112,117
1996	4,436,523	1,232,174	—	—	—	—	5,668,697
1997	6,688,175	1,825,383	—	—	123,049	—	8,636,607
1998	16,499,427	2,918,818	—	—	—	—	19,418,245
1999	9,607,428	3,273,878	—	—	—	4,783	12,886,089
2000	9,125,506	3,127,762	—	—	—	20,744	12,274,012
2001	10,855,046	3,960,348	—	—	4,046	20,261	14,839,701
2002 ^(R) . . .	12,820,322	4,295,112	—	—	130,930	10,201	17,256,565
2003	12,494,809	3,835,371	—	—	1910	28,649	16,360,738

(R) = revised.

^aUnspecified emission reductions represent quantities reported on the short form (Form EIA-1605EZ), which does not distinguish between direct and indirect emission reductions or sequestration.

Notes: Reductions of CFCs, HCFCs, and methyl chloroform are not included in the totals because of the uncertainty associated with estimates of their net global warming potential. Their direct warming effects (positive radiative forcing) are offset by indirect cooling effects (destruction of stratospheric ozone, another greenhouse gas). Totals may not equal sum of components due to independent rounding. Direct, indirect, and unspecified emission reductions and sequestration have not been totaled, in order to avoid double counting of reductions or sequestration that have may been reported by more than one entity. Negative reductions represent increases in emissions.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

totaled 6.9 million metric tons carbon dioxide equivalent, 1 percent more than was reported for 2002.

Commitments

For 2003, formal commitments to reduce emissions, take specific action to reduce emissions, or provide financial support for activities related to greenhouse gas reductions were reported by 89 entities,⁶ nearly one-third (30 percent) of which were electricity generators participating in DOE's Climate Challenge Program (Figure 3). Other voluntary programs represented among the commitments reported for 2003 included the EPA's Climate Wise, the EPA's Voluntary Aluminum Industrial Program, the U.S. Initiative on Joint Implementation, the EPA's Green Lights Program, the EPA's Landfill Methane Outreach Program, DOE's Motor Challenge, the EPA's Sulfur Hexafluoride Emissions Reduction Partnership for Electric Power Systems, DOE's Cool Communities Program, DOE/EPA ENERGY STAR Buildings, EPA's Natural Gas Star, and DOE's Renewable Energy Commercialization Program.⁷

There are three forms of future commitment in the Voluntary Reporting Program: entity commitments,

financial commitments, and project commitments. Entity and project commitments roughly parallel the entity and project aspects of emissions reporting: an entity commitment is a commitment to reduce the emissions of an entire organization; a project commitment is a commitment to take a particular action that will have the effect of reducing the reporter's emissions through a specific project. A financial commitment is a pledge to spend a particular sum of money on activities related to emission reductions, without a specific promise as to the emissions consequences of the expenditure.

For 2003, 55 firms made 60 specific promises to reduce, avoid, or sequester future emissions at the entity level. Some of those entity-level commitments were to reduce emissions below a specific baseline, others to limit the growth of emissions per unit of output, and others to limit emissions by a specific amount relative to a baseline emissions growth trend. In their reports for 2003, companies reported commitments to reduce entity-level emissions by a total of 86 million metric tons carbon dioxide equivalent, including 14 commitments, representing 68 million metric tons carbon dioxide equivalent or 79 percent of the emission reductions promised, that

Table 6. Number of Projects Reported on Form EIA-1605 by Reduction Objective, Project Type, and Reference Case Employed, Data Year 2003
(Number of Projects)

Reduction Objective and Project Type	Type of Reference Case				Total Number of Projects
	Modified		Basic		
	Number of Projects	Percent	Number of Projects	Percent	
Reducing Carbon Dioxide Emissions	867	94	56	6	923
Electricity Generation, Transmission, and Distribution	458	99	4	1	462
Cogeneration and Waste Heat Recovery	19	90	2	10	21
Energy End Use	328	88	46	12	374
Transportation and Offroad Vehicles	62	94	4	6	66
Reducing Methane and Nitrous Oxide Emissions	463	99	7	1	470
Waste Treatment and Disposal (Methane)	421	99	4	1	425
Agriculture (Methane and Nitrous Oxide)	4	100	0	0	4
Oil and Natural Gas Systems and Coal Mining (Methane)	38	93	3	7	41
Carbon Sequestration	429	96	17	4	446
Halogenated Substances	25	58	18	42	43
Other Emission Reduction Projects	74	88	10	12	84
Total	1,858	95	108	5	1,966

Notes: Excludes projects reported on the short form (Form EIA-1605EZ), which does not collect information on the reference case employed. Excludes two projects reported on the long form (Form EIA-1605) for which no reference case was specified because reductions were not estimated. Table excludes projects submitted in confidential reports.

Source: Energy Information Administration, Forms EIA-1605.

⁶Formal commitments in one or more of the entity-level, project-level, or financial categories accommodated by Form EIA-1605 were reported by 81 companies. Descriptions of future activities were provided by 8 companies in the Additional Information section of Schedule IV.

⁷In 2001, the Climate Wise and Green Lights voluntary programs were incorporated into ENERGY STAR, a joint program of the U.S. Department of Energy and the U.S. Environmental Protection Agency.

were to be fulfilled by 2003 or earlier. The 12 other entity-level commitments, which promised reductions totaling 18 million metric tons carbon dioxide equivalent, were to be fulfilled by 2004 or later.

Commitments to undertake 116 individual emission reduction projects were reported by 22 companies. Some of the commitments were linked to results from projects

already underway and forming part of the reporters' submissions. Others were for projects not yet begun. Reporters indicated that the projects were expected to reduce future emissions or increase carbon sequestration by 73 million metric tons carbon dioxide equivalent. In addition, 20 firms made 40 financial commitments. The total amount of funds promised was \$50 million, of which \$4 million was spent in 2003.

Table 7. Reported Emission Reductions and Sequestration for Projects Reported on Form EIA-1605 by Reduction Objective, Project Type, Source, and Reference Case Employed, Data Year 2003
(Million Metric Tons Carbon Dioxide Equivalent)

Reduction Objective and Project Type	Direct Reductions		Indirect Reductions		Sequestration	
	Modified	Basic	Modified	Basic	Modified	Basic
Reducing Carbon Dioxide Emissions	184.4	1.3	27.8	0.1	NA	NA
Electricity Generation, Transmission, and Distribution	157.2	0.6	14.7	*	NA	NA
Cogeneration and Waste Heat Recovery	0.1	*	3.1	*	NA	NA
Energy End Use	24.7	0.6	9.9	0.1	NA	NA
Transportation and Offroad Vehicles	2.5	*	0.1	*	NA	NA
Reducing Methane and Nitrous Oxide Emissions	68.2	0.4	38.6	1.2	NA	NA
Waste Treatment and Disposal (Methane)	47.6	0.4	38.6	1.2	NA	NA
Agriculture (Methane and Nitrous Oxide)	*	NA	*	NA	NA	NA
Oil and Natural Gas Systems and Coal Mining (Methane)	20.6	*	*	NA	NA	NA
Carbon Sequestration	0.0	NA	NA	NA	7.3	0.5
Halogenated Substances	0.5	5.6	2.2	NA	NA	NA
Other Emission Reduction Projects	7.8	NA	6.1	5.0	NA	NA
Total	261.0	7.3	74.8	6.3	7.3	0.1

Note: Excludes reductions and sequestration for projects reported on the short form (Form EIA-1605EZ), which does not collect information on the reference case employed. Excludes projects submitted in confidential reports.
Source: Energy Information Administration, Form EIA-1605.

Table 8. Number of Entities Reporting at the Entity Level, Reported Emissions by Source, Emission Reductions by Source and Type of Reference Case Employed, and Sequestration, Data Years 1994-2003
(Million Metric Tons Carbon Dioxide Equivalent)

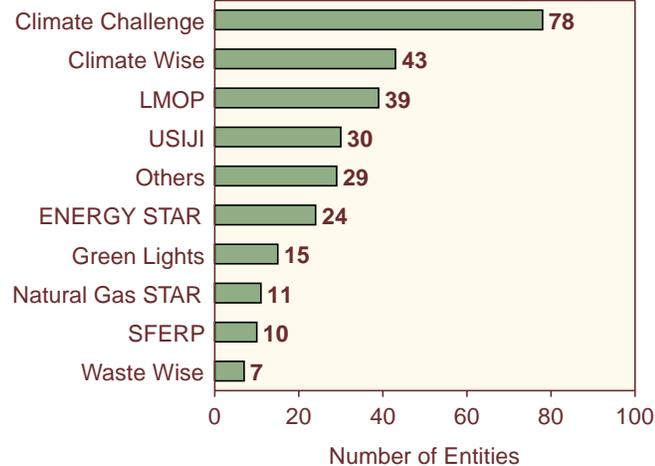
Year	Number of Entities Reporting	Emissions		Emission Reductions by Type of Reference Case						Sequestration
		Direct	Indirect	Direct			Indirect			
				Modified	Basic	Total	Modified	Basic	Total	
1994	39	752.7	494.9	38.2	22.6	60.8	1.6	1.2	2.8	0.5
1995	50	875.8	499.6	56.0	39.3	95.3	46.0	2.7	48.6	0.8
1996	55	1,183.1	461.5	65.4	44.6	110.0	42.9	5.7	48.6	7.9
1997	60	1,006.6	525.8	73.7	20.3	94.0	24.8	3.4	28.2	7.1
1998	76	1,110.7	473.5	105.8	22.6	128.4	28.3	13.2	41.6	11.2
1999	83	967.9	481.0	114.7	35.3	150.0	30.3	8.4	38.7	8.4
2000	109	1,068.2	111.7	123.6	83.0	206.7	34.8	-7.8	27.0	7.5
2001 ^(R) . .	113	799.6	111.5	121.4	90.4	211.9	38.9	-6.7	32.2	7.5
2002 ^(R) . .	119	889.3	111.2	148.4	83.3	231.6	44.2	-8.3	35.9	6.8
2003	126	888.8	104.7	182.4	31.8	214.2	45.6	-3.0	42.6	6.9

(R) = revised.

Notes: 2002 data year includes late reports that were not received in time to be included in last year's annual report and database. Negative reductions represent increases in emissions.

Source: Energy Information Administration, Form EIA-1605.

Figure 3. Number of Entities Reporting Commitments Associated with Voluntary Programs in Data Year 2003, by Program



Notes: LMOP = Landfill Methane Outreach Program, USIJI = United States Initiative on Joint Implementation, SFERP = Sulfur Hexafluoride Emissions Reduction Partnership. Others include Coalbed Methane Outreach Program, Cool Communities Program, Motor Challenge Program, and Voluntary Aluminum Industry Partnership. The sum of entities reporting commitments associated with each program exceeds the total number of entities reporting commitments because several entities reported commitments associated with more than one program.

Source: Energy Information Administration, Form EIA-1605.

Status of Policy Initiatives

In 2004, the Bush Administration continued to develop components of its Global Climate Change Initiative, which is expected to include enhancements to the Voluntary Reporting of Greenhouse Gases Program (see boxes on pages 14 and 15). In addition, some States and other organizations continued progress toward the development of greenhouse gas registry and trading programs; and the U.S. Congress considered, but did not pass, legislation relevant to greenhouse gas reporting. These developments, which occurred in 2003, would not have affected the reported emissions and emission reductions data for activities in 2003 discussed in this report, even if they had been formalized in laws or policies; however, they may affect the future of the Voluntary Reporting Program, future reporting of reductions or commitments, or both.

Enhanced 1605(b) Voluntary Emissions Reduction Registry

Pursuant to a key objective of the Global Climate Change Initiative, DOE is working to improve and expand the 1605(b) Voluntary Reporting of Greenhouse Gases Program. The primary goal of this effort is to create a credible and transparent program to report real

reductions that support the national greenhouse gas intensity goal laid out in the Global Climate Change Initiative. In addition, a goal of the enhanced 1605(b) Program is to allow businesses and individuals to record their reductions and ensure that reporters are not penalized under a future climate policy. The objective of improving the registry is to help motivate firms to take cost-effective, voluntary actions to reduce greenhouse gas emissions, which would, in part, aid in the achievement of the Initiative's greenhouse gas intensity goal.

An interagency working group has undertaken several actions to improve the Voluntary Reporting Program, including outreach efforts, solicitation of public comments, and review of the existing program. On July 8, 2002, the Secretary of Energy, joined by the Secretary of Commerce, the Secretary of Agriculture, and the EPA Administrator, submitted recommendations to the White House to guide the process for improving and expanding the Voluntary Reporting Program.

In 2004, DOE continued to collaborate with the Department of Agriculture, the EPA, and other Federal agencies in developing revised Guidelines for the Voluntary Reporting of Greenhouse Gases Program. In November 2003, DOE released proposed revisions to the General Guidelines, which outline the principles that would govern the revised program, and also held a public workshop on the subject in Washington, DC, on January 12, 2004. The Technical Guidelines will specify the methods and factors to be used in measuring and estimating greenhouse gas emissions, emission reductions, and carbon sequestration under the revised Program.

Other U.S., State, and International Greenhouse Gas Initiatives and Registry Programs

In addition to activity on revisions to the Voluntary Reporting Program, a number of other efforts at the Federal, State, and international levels to reduce greenhouse gas emissions are being actively pursued. Some of those efforts are summarized below.

Climate VISION. Climate VISION—Voluntary Innovative Sector Initiatives: Opportunities Now—is a Presidential public-private partnership initiative launched by DOE on February 12, 2003, to contribute to the President's goal of reducing U.S. greenhouse gas emissions intensity—the ratio of emissions to economic output by American industry—by 18 percent over the next 10 years without sacrificing economic growth. Other agencies participating in Climate VISION include the EPA, Department of Transportation, Department of Agriculture, and Department of the Interior.

Business associations representing 12 industry sectors and the Business Roundtable have become program

partners with the Federal Government and have issued letters of intent to meet specific targets for reducing greenhouse gas emissions intensity. These Climate VISION partners, which include some of the largest companies in America, represent a broad range of industry sectors: oil and gas production, transportation, and refining; electricity generation; coal and mineral production and mining; manufacturing (automobiles, cement, iron and steel, magnesium, aluminum, chemicals, and semiconductors); railroads; and forest products. In December 2004, as part of its Climate VISION commitment, the electric power industry pledged to reduce collectively the power sector's greenhouse gas emissions

intensity by the equivalent of 3 to 5 percent (measured as carbon emissions per unit of electricity produced) below 2000-2002 baseline levels, measured over the 2010-2012 period.

Climate Leaders. Climate Leaders is a voluntary industry-government partnership that encourages companies to establish and meet clear greenhouse gas emission reduction targets. EPA established Climate Leaders in February 2002 and has recruited 62 partners, 27 of which have established greenhouse gas reduction goals. By joining Climate Leaders, the partners commit themselves to documenting their emissions of the six major

The Global Climate Change Initiative

On February 14, 2002, President George W. Bush announced the Administration's Global Climate Change Initiative, which includes new emission intensity reduction goals, incentives for clean technology development, added support for scientific research, expanded collaboration with foreign governments on climate change, and the development of a framework for the enhancement of the Voluntary Reporting of Greenhouse Gases Program.

A primary goal of the Global Climate Change Initiative is to slow the growth rate of greenhouse gas emissions while sustaining economic growth, using market mechanisms and energy technology development. In the proposal, the President established a national goal of reducing the greenhouse gas intensity of the U.S. economy by 18 percent between 2002 and 2012. Emissions intensity is a measure of the ratio of greenhouse gas emissions to economic output (gross domestic product). To achieve the goal, the Initiative focuses on fossil fuel energy conservation, methane recovery, and carbon sequestration in the short term and development of advanced energy technologies in the longer term.

Key domestic and international elements of the Global Climate Change Initiative include:

- Domestic climate change initiatives:
 - Enhancement of the 1605(b) Voluntary Reporting of Greenhouse Gases Program
 - Significantly expanded funding for basic scientific research and advanced technology development
 - Tax incentives, such as credits for renewable energy, cogeneration, and new technology
 - Challenges for business to undertake voluntary initiatives and commit to greenhouse gas intensity goals, such as through recent agreements

with the semiconductor and aluminum industries

- Transportation programs, including technology research and development and fuel economy standards
- Carbon sequestration programs, which include increased funding for U.S. Department of Agriculture conservation programs under the Farm Bill to enhance the natural storage of carbon, promote the development of targeted incentives for forestry and agriculture projects to increase carbon sequestration, and establish accounting rules and guidelines for crediting sequestration projects
- International climate change initiatives:
 - Investments in climate observation systems in developing countries
 - Funding for "debt-for-nature" forest conservation programs
 - Use of economic incentives to encourage developing countries to participate in climate change initiatives
 - Expanding technology transfer and capacity building in the developing world
 - Joint research with Japan, Italy, and Central America.

The Global Climate Change Initiative includes a future progress check: the U.S. Government, in 2012, will evaluate whether its greenhouse gas emissions reduction progress is sufficient and whether scientific understanding at that time will justify further action. If further action is deemed necessary, the Initiative proposes to accelerate technology development and deployment using additional market-based mechanisms, voluntary measures, and incentive programs.

greenhouse gases (carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and SF₆) on a company-wide, facility-level basis (including, at a minimum, all their domestic facilities). Partners are required to develop an Inventory Management Plan (IMP) and report their annual corporate level emissions by emission source type to the EPA, using the EPA's Annual GHG Inventory Summary and Goal Tracking Form.⁸

In October 2004, the EPA issued updated guidance for corporate greenhouse gas inventories based on the existing protocol developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), described below. The EPA has finalized guidance covering design principles and cross-sector core guidance covering direct emissions from stationary combustion, indirect emissions from sales and purchases of electricity and steam, direct emissions from mobile sources, and direct emissions of HFCs and PFCs from refrigeration and air conditioning systems. The EPA has also completed draft sector-specific guidance for core emissions from the following industries: cement, manufacture of refrigeration and air conditioning equipment (HFC and PFC emissions), iron and steel, and municipal solid waste landfilling. The EPA is currently developing sector-specific guidance for aluminum production, pulp and paper production,

semiconductor manufacturing, and SF₆ from electricity distribution.

California. The California Climate Action Registry (CCAR), established by the California Legislature in 2000, is a voluntary program for reporting and registering greenhouse gas emissions that occur inside or outside the State of California. CCAR issued reporting protocols and began enrolling members in October 2002 and, in December 2003, released an online reporting tool, the California Action Registry Reporting On-line Tool (CARROT), in order to simplify the inventorying and reporting of greenhouse gas emissions by program participants. CCAR requires third-party verification of reported emissions and has pledged to protect participants' reported reductions under possible future regulatory programs. As of November 2004, CCAR had enrolled 43 organizations and companies.⁹ In October 2004, CCAR released a protocol for the accounting of carbon emissions and reductions associated with forest conservation, improved management practices, and reforestation and issued revised guidance for calculating greenhouse gas emissions from electric power generation.

Wisconsin. Wisconsin has developed a registry for recording reductions in emissions of greenhouse gases

Recommendations for Improving the Voluntary Reporting of Greenhouse Gases Program

The Secretaries of Energy, Commerce, and Agriculture and the EPA Administrator on July 8, 2002, submitted to the White House the following recommendations for improving and expanding the Voluntary Reporting of Greenhouse Gases Program:

- Develop fair, objective, and practical methods for reporting baselines, reporting boundaries, calculating real results, and awarding transferable credits for actions that lead to real reductions
- Standardize widely accepted, transparent accounting methods
- Support independent verification of registry reports
- Encourage reporters to report greenhouse gas intensity (emissions per unit of output) as well as emissions or emission reductions
- Encourage corporate or entity-wide reporting
- Provide credits for actions to remove carbon dioxide from the atmosphere (e.g., sequestration activities) as well as for actions to reduce emissions
- Develop a process for evaluating the extent to which past reductions may qualify for credits
- Ensure that the Voluntary Reporting Program will be an effective tool to assist in reaching the goal of an 18-percent reduction in greenhouse gas intensity
- Factor in international strategies as well as State-level efforts
- Minimize transactions costs for reporters and administrative costs for the Government, where possible, without compromising the recommendations above.

⁸U.S. Environmental Protection Agency, Climate Leaders Program, "Annual GHG Inventory Summary and Goal Tracking Form," web site www.epa.gov/climateleaders/summaryform.xls. For information on Climate Leaders Program reporting requirements, see web site www.epa.gov/climateleaders/reportreq.html.

⁹See web site www.climateregistry.org/members. Seven of the organizations have at one time or another submitted reports to the Voluntary Reporting Program, including the following reporters for 2003: BP America, Los Angeles Department of Water and Power, PG&E Corporation, Sacramento Municipal Utility District, and Southern California Edison.

and other pollutants. To date, 7 organizations have registered emission reductions, 3 of which include reductions of carbon dioxide totaling over 310,000 metric tons.

Northeastern States. The six New England States and the Eastern Canadian Provinces (New Brunswick, Newfoundland and Labrador, Nova Scotia, Prince Edward Island, and Quebec) are engaged in a joint effort to develop a regional greenhouse gas registry, as specified in the New England Governors and Eastern Canadian Premiers (NEG/ECP) Climate Change Action Plan, which was issued in 2001. In the United States, the Northeast States for Coordinated Air Use Management (NESCAUM), an interstate association of air quality control divisions from the New England States, New York, and New Jersey, has spearheaded this effort.¹⁰

In October 2003, as part of a New England States' NEG/ECP Climate Action Plan commitment, NESCAUM launched the Regional Greenhouse Gas Registry (RGGR), which has adopted the emissions accounting and reporting protocols developed by WRI/WBCSD and is collaborating with the California Climate Action Registry to ensure that the registries will be compatible.¹¹ In May 2004, the Connecticut legislature passed a bill that requires any entity that reports other air emissions to report direct greenhouse gas emissions to the RGGR beginning in July 2006. All entities whose direct and indirect emissions of greenhouse gases exceed 10,000 metric tons carbon dioxide equivalent will be required to report those emissions to the RGGR beginning in July 2008.¹² NESCAUM is also initiating Phase II of the Greenhouse Gas Emissions Trading Demonstration Project, which will include further examination of baseline scenarios and multi-pollutant caps and a comprehensive assessment of early actions to reduce greenhouse gas emissions reported to the Voluntary Reporting of Greenhouse Gases Program.¹³

West Coast States. In September 2003, the governors of Washington, Oregon, and California announced a joint

initiative to address climate change by developing policy recommendations on a range of issues that require regional cooperation, including the development of protocols and standard accounting methods for greenhouse gas emissions reporting.¹⁴ In November 2004, the governors approved a series of recommendations stemming from this initiative. The recommendations identified a market-based carbon allowance program as an area holding significant promise for achieving regional greenhouse gas reductions. The governors have directed their State agencies to continue the initiative in 2005.¹⁵

Georgia. In May 2004, the Georgia legislature enacted the Georgia Carbon Sequestration Registry Act, which establishes a voluntary registry for carbon sequestration projects that offset greenhouse gas emissions. The State Forestry Commission is responsible for developing the rules for the program, and the Georgia Superior Court Clerks' Cooperative Authority will administer the registry, which will include a State-wide uniform automated electronic information system.¹⁶

Other States. Other States, including Illinois, Iowa, Maine, and Texas, have taken initial steps toward the development of State-level registries of greenhouse gas emissions.

WRI/WBCSD Greenhouse Gas Protocol Initiative. The WRI/WBCSD Greenhouse Gas Protocol initiative is an international program for developing accounting and reporting standards for greenhouse gas emissions and reductions that can be adopted by other reporting programs and registries. WRI/WBCSD has developed a corporate protocol for entity-level reporting, which was revised in 2004, and several calculation tools to support the preparation of corporate greenhouse gas inventories.¹⁷ WRI/WBCSD continued to develop a project module in 2004.¹⁸

World Economic Forum Global Greenhouse Gas Register. In December 2003, the World Economic Forum

¹⁰Conference of New England Governors and Eastern Canadian Premiers, *Report to the New England Governors and Eastern Canadian Premiers on Climate Change Projects* (August 2003), web site www.cap-cpma.ca/images/pdf/eng/2003ReportClimate.pdf.

¹¹Regional Greenhouse Gas Registry, "About the Project," web site www.rggr.us.

¹²State of Connecticut, "An Act Concerning Climate Change," Public Act No. 04-252, web site www.cga.ct.gov/2004/act/Pa/2004PA-00252-R005B-00595-PA.htm.

¹³Northeast States for Coordinated Air Use Management, "Overview of the NESCAUM Greenhouse Gas Emissions Trading Demonstration Project: Phase II," web site www.nescaum.org/Greenhouse.

¹⁴"Statement of the Governors of California, Oregon and Washington on Regional Action to Address Global Warming" (September 22, 2003), web site www.climatesolutions.org/pubs/pdfs/GovernorsStatement.pdf.

¹⁵West Coast Governors' Climate Change Initiative, "West Coast States Strengthen Joint Climate Protection Strategy," Joint News Release (November 18, 2004), web site www.energy.ca.gov/global_climate_change/westcoastgov/releases/2004-11-18_JOINT_RELEASE.PDF.

¹⁶Georgia General Assembly, SB 356, "Georgia Carbon Sequestration Registry Act," web site www.legis.state.ga.us/legis/2003_04/versions/sb356_LC_25_3622S_hss_7.htm.

¹⁷World Business Council for Sustainable Development and World Resources Institute, *Greenhouse Gas Protocol Initiative Newsletter*, No. 11 (April 2004), web site www.ghgprotocol.org/docs/GHG_Protocol_Newsletter_No_11.pdf.

¹⁸World Business Council for Sustainable Development and World Resources Institute, *Greenhouse Gas Protocol Initiative Newsletter*, No. 13 (November 2004), web site www.ghgprotocol.org/docs/GHG_Protocol_Newsletter_No_13.pdf.

announced the creation of a Global Greenhouse Gas Register to provide a transparent, internationally consistent framework for companies to report emissions inventories and reduction targets. In 2004, 5 more companies (Alcan, Alcoa, Holcim, Santos, and Vitro) committed to participation in the registry,¹⁹ joining the 8 founding members (Anglo American, Cemex, Hewlett-Packard, Lafarge, RAO Unified UESR, RWE, ScottishPower, and Vattenfall).²⁰ The Global Greenhouse Gas Register intended to begin accepting reports in January 2004, using reporting software based on CCAR's CARROT software.²¹ As of November 2004, two participants (Cemex and Hewlett-Packard) had submitted annual emissions summary reports.²²

Federal Legislation on Voluntary Greenhouse Gas Reporting

The second session of the 108th Congress, which convened in January 2004, produced little new action on legislation addressing the reporting of greenhouse gas emissions, emission reductions, and carbon sequestration by individual entities. The major exception was the introduction of the Climate Stewardship Act of 2004 (H.R. 4067) in the House of Representatives by Rep. Wayne Gilchrest (R-MD) and 19 cosponsors. The bill is a slightly revised version of the McCain-Lieberman

Climate Stewardship Act of 2003 (S. 139), which was rejected by the Senate in a 45-53 floor vote in October 2003.²³

H.R. 4067 would require covered entities (those with annual greenhouse gas emissions of more than 10,000 metric tons carbon dioxide equivalent) to submit an inventory of their emissions for the preceding year, beginning in 2008. The bill would limit greenhouse gas emissions by establishing a system of tradable emissions allowances, similar to the cap-and-trade system that has been used to limit sulfur dioxide emissions from electric power plants. Beginning in 2010, covered entities would be required to submit to the EPA allowances for emissions of greenhouse gases from stationary sources. Producers and importers of HFCs, PFCs, and SF₆ and producers and importers of fossil fuels used for transportation would also be required to submit to the EPA allowances for the products they sell that result in emissions of greenhouse gases. The objective of the legislation is to reduce emissions by the covered entities to 2000 levels by 2010. The bill also includes provisions for voluntary reporting of greenhouse gas emission reductions achieved between 1990 and 2010. Allowance allocation credits would be awarded to the reporters of emission reductions.

¹⁹World Economic Forum, "Greenhouse Gas Register," web site www.weforum.org/site/homepublic.nsf/Content/Global+Greenhouse+Gas+Register%5CParticipants+%26+Partners.

²⁰World Economic Forum, "Global Greenhouse Gas Register Launched" (Press Release, January 12, 2004), web site www.weforum.org/site/homepublic.nsf/Content/Global+Greenhouse+Gas+Register+Launched.

²¹California Climate Action Registry, "CA Registry's Online Tool To Serve as Foundation for Global Greenhouse Gas Register" (Press Release, December 9, 2003), web site www.climateregistry.org/docs/PRESS/GHGRegister120903.pdf.

²²World Economic Forum, "Public Annual Emission Summary Report," web site www.ghgr.org/public/PublicAnnualSummaryReport.aspx.

²³"Senate Defeats Climate Bill, But Proponents See Silver Lining," *New York Times* (October 31, 2003).

