

# 1. Voluntary Reporting 2004: 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).<sup>1</sup> DOE's Office of Policy and International Affairs developed the Guidelines to the Voluntary Reporting of Greenhouse Gases Program<sup>2</sup> 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 voluntarily reduce greenhouse gas emissions or sequester carbon, the program serves to identify innovative and effective ways of reducing emissions.

This report presents information on the eleventh reporting cycle of the Voluntary Reporting Program, including reported information on emissions, emission reductions, and carbon sequestration activities through 2004. 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 initiatives related to the voluntary reporting of greenhouse gas emissions.

Chapters 2 through 6 provide a review of project-level emission reduction initiatives reported to the Program in detail on Form EIA-1605. Chapter 2 examines projects in the electricity sector that reduce carbon dioxide emissions through improving thermal efficiency 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 downloading it from EIA's web site at [www.eia.doe.gov/oiaf/1605/databases.html](http://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 Public Use 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:<sup>3</sup>

- 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.

<sup>1</sup>Title 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.

<sup>2</sup>See 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](http://www.eia.doe.gov/oiaf/1605/guidelns.html).

<sup>3</sup>Testimony 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](http://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 2004 data year were submitted by 226 participants in 24 different industries or services (defined by the two-digit Standard Industrial Classification code), a decrease from the 28 different industries represented among 2003 reporters. In comparison, 108 participants in 9 different industries or services submitted reports for the 1994 data year, the first year of the program (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 1994-2004 (Number of Reports)**

SIC Code	Description	Data Year										
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 <sup>(R)</sup>	2004
01	Agricultural Production: Crops. . . . .	—	—	—	—	1	—	—	1	—	—	—
08	Forestry . . . . .	1	2	1	1	3	3	1	—	1	2	3
12	Coal Mining . . . . .	1	2	2	1	4	4	4	6	7	4	4
13	Oil and Gas Extraction . . . . .	—	—	—	—	—	1	1	1	2	2	1
14	Nonmetallic Minerals, Except Fuels . . . . .	—	—	—	—	1	1	—	—	—	—	—
20	Food and Kindred Products. . . . .	—	—	—	—	1	2	6	4	4	4	2
22	Textile Mill Products . . . . .	—	—	—	—	—	1	5	11	12	14	14
23	Apparel and Other Textile Products . . . . .	—	—	—	—	—	—	1	1	2	2	2
24	Lumber and Wood Products . . . . .	—	—	—	—	—	—	1	1	—	1	—
25	Furniture and Fixtures . . . . .	—	—	—	—	—	—	1	1	1	—	—
26	Paper and Allied Products. . . . .	—	—	—	—	—	1	1	—	—	—	—
27	Printing and Publishing . . . . .	—	1	—	1	—	1	1	—	—	—	—
28	Chemical and Allied Products . . . . .	1	3	2	3	8	5	11	9	11	11	12
29	Petroleum Refining and Other Related Industries. . . . .	—	—	2	3	8	8	7	6	6	5	5
30	Rubber and Miscellaneous Plastic Products. . . . .	—	—	—	—	—	—	2	2	2	2	2
32	Stone, Clay, Glass, and Concrete Products . . . . .	—	—	2	4	12	13	7	5	5	5	5
33	Primary Metals Industries . . . . .	2	2	4	4	5	5	5	11	11	13	13
34	Fabricated Metal Products, Except Machinery and Transportation Equipment. . . . .	—	2	1	1	4	2	2	1	1	1	1
35	Industrial and Commercial Equipment and Components . . . . .	—	—	—	—	—	—	1	1	1	2	2
36	Electronic and Other Electrical Equipment . . . . .	1	1	2	4	4	4	9	9	8	6	5
37	Transportation Equipment. . . . .	1	1	1	2	3	5	6	7	9	10	10
38	Instruments and Related Products . . . . .	—	—	—	—	2	—	1	1	1	1	1
39	Miscellaneous Manufacturing Industries. . . . .	—	1	1	—	2	2	1	1	1	1	—
40	Railroad Transportation. . . . .	—	—	—	—	—	—	—	—	—	1	1
48	Communications . . . . .	—	—	—	—	—	1	—	—	1	1	1
49	Electric, Gas, and Sanitary Services. . . . .	98	123	125	129	138	135	151	145	138	145	136
57	Furniture and Home Furnishings Stores . . . . .	—	—	—	—	2	1	1	—	1	1	1
63	Insurance Carriers. . . . .	—	—	—	—	—	—	—	—	—	1	1
65	Real Estate . . . . .	—	1	1	1	1	1	1	1	1	—	—
67	Holding and Other Investment Offices . . . . .	—	—	1	1	1	1	1	1	2	2	1
72	Personal Services . . . . .	—	—	—	—	—	—	1	1	1	1	1
80	Health Services. . . . .	—	—	—	—	1	—	—	—	—	—	—
82	Educational Services. . . . .	1	2	2	2	—	2	—	—	—	—	—
86	Membership Organizations . . . . .	—	—	—	1	1	1	1	—	1	—	—
87	Engineering and Management Services . . . . .	—	—	2	2	2	1	—	1	—	—	—
88	Private Households . . . . .	2	1	1	1	1	1	1	1	1	1	2
89	Services Not Elsewhere Classified . . . . .	—	—	—	1	1	3	2	1	1	1	—
91	Executive, Legislative, and General . . . . .	—	—	—	—	1	2	2	2	1	1	—
97	National Security and International Affairs . . . . .	—	—	—	—	—	—	1	—	—	—	—
99	Nonclassifiable Establishments. . . . .	—	—	—	—	—	—	—	—	1	—	—
<b>Total Number of Reporters . . . . .</b>		<b>108</b>	<b>142</b>	<b>150</b>	<b>162</b>	<b>207</b>	<b>207</b>	<b>236</b>	<b>232</b>	<b>234</b>	<b>241<sup>a</sup></b>	<b>226</b>
<b>Number of 2-Digit SIC Codes Represented . . . . .</b>		<b>9</b>	<b>13</b>	<b>16</b>	<b>18</b>	<b>24</b>	<b>27</b>	<b>31</b>	<b>27</b>	<b>29</b>	<b>28<sup>a</sup></b>	<b>24</b>

<sup>a</sup>Includes 7 late reports for the 2003 data year. The 2004 total will also be revised upward in next year's report with the inclusion of additional 2004 reports. As of February 17, 2006, EIA had received 5 late reports for 2004. In addition, Tucson Electric Company submitted a 2004 report by the deadline, which EIA inadvertently failed to process in time for inclusion in this report's database.

(R) = Revised.

Note: The Voluntary Reporting of Greenhouse Gases database was designed in 1994-1995, when the Standard Industrial Classification (SIC) system was still in use. For the 2006 data year reporting cycle (to be conducted in calendar year 2007), EIA plans to modify the database to use the North American Industry Classification System (NAICS), which was introduced in 1997 by the United States, Canada, and Mexico to provide comparability in statistics about business activity across North America.

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 2004 were from the electric power sector.

Although the number of reporters from other individual industries remained relatively small, in many cases, key companies in those other industries submitted reports, including: 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 2004 reporters is provided in Appendix B, Table B1.

Many reporters indicated that their projects were affiliated with one or more government-sponsored voluntary programs. Among the projects reported, the following programs were cited: EPA's Landfill Methane Outreach

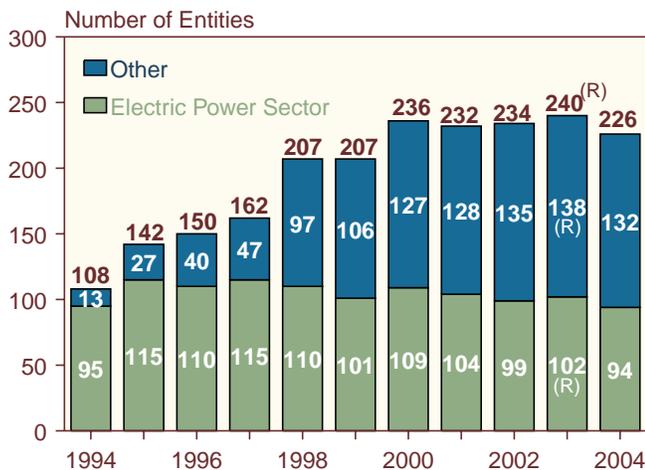
Program (349 projects); various DOE/EPA ENERGY STAR programs, including ENERGY STAR Buildings, ENERGY STAR Computers, and ENERGY STAR Transformers (113 projects); U.S. Initiative on Joint Implementation (34 projects); EPA's Natural Gas STAR Program (24 projects), EPA's Sulfur Hexafluoride Emissions Reduction Partnership (13 projects); EPA's WasteWise (9 projects); DOE's Compressed Air Challenge (8 projects); and EPA's Coalbed Methane Outreach Program (5 projects). Other voluntary programs cited by the reporters included EPA's Voluntary Aluminum Industrial Partnership and DOE's Motor Challenge and Rebuild America. 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 of 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 of emissions, emission reductions, and carbon sequestration for an entire organization, usually defined as a corporation
- Commitment reporting, defined as the reporting of pledges to take action to reduce emissions in the future.

**Figure 1. Electric Power Sector and Other Entities Submitting Reports to the Voluntary Reporting of Greenhouse Gases Program, Data Years 1994-2004**



(R) = revised.

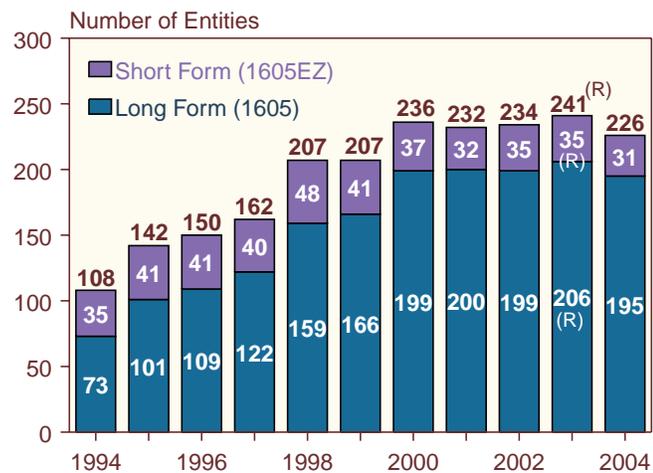
Notes: Electric power sector includes electric utilities and independent power producers. 2003 data year includes 7 late reports that were not included in the totals presented in last year's annual report and database.

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

Of the 226 reports received for 2004, 195 (86 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 to provide only 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 has declined from 32 percent in the first year of the program (1994 data year) to 14 percent in the 2004 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, several voluntary programs (such as the Landfill Methane Outreach Program) encourage participants to use the long form.

For the 2004 reporting year, 176 program participants (78 percent of the total) reported project-level reductions, 122 reported entity-level emissions and/or reductions, 72 reported at both the entity and project levels, 104 submitted only project-level reports, and 50

**Figure 2. Number of Reports Received by Form Type, Data Years 1994-2004**



(R) = revised.

Notes: Electric power sector includes electric utilities and independent power producers. 2003 data year includes 7 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.

reported only entity-level information. In addition, 86 reporters provided information on their commitments to reduce emissions or to increase sequestration in the future, including one program participant reporting 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, sequestered, 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 2,154 projects for 2004 (Table 2). Most (1,942 or 90 percent) were reported on the long form. The total number of projects reported declined by 68, or 3 percent, compared with the previous reporting cycle.<sup>4</sup> Most of the 2,154 projects reported for 2004 were also among the 2,222 projects reported for 2003, because they continued to yield emission reductions in 2004. Projects often yield emission reductions over an extended period; for example, an

**Table 2. Distribution of Projects by Reduction Objective, Project Type, and Form Type, Data Year 2004**

Reduction Objective and Project Type	Number of Projects			Number of Reporters		
	Long Form	Short Form	Total	Long Form	Short Form	Total
<b>Reducing Carbon Dioxide Emissions</b> .....	<b>897</b>	<b>159</b>	<b>1,056</b>	<b>86</b>	<b>26</b>	<b>112</b>
Electricity Generation, Transmission, and Distribution .....	469	49	518	65	19	84
Cogeneration and Waste Heat Recovery .....	18	0	18	11	0	11
Energy End Use .....	345	101	446	64	17	81
Transportation and Offroad Vehicles .....	65	9	74	31	5	36
<b>Reducing Methane and Nitrous Oxide Emissions</b> .....	<b>443</b>	<b>20</b>	<b>463</b>	<b>66</b>	<b>5</b>	<b>71</b>
Waste Treatment and Disposal (Methane) .....	403	19	422	52	4	56
Agriculture (Methane and Nitrous Oxide) .....	2	0	2	2	0	2
Oil and Natural Gas Systems and Coal Mining (Methane) .....	38	1	39	19	1	20
<b>Carbon Sequestration</b> .....	<b>478</b>	<b>15</b>	<b>493</b>	<b>54</b>	<b>13</b>	<b>67</b>
<b>Halogenated Substances</b> .....	<b>40</b>	<b>1</b>	<b>41</b>	<b>28</b>	<b>1</b>	<b>29</b>
<b>Other Emission Reduction Projects</b> .....	<b>84</b>	<b>17</b>	<b>101</b>	<b>47</b>	<b>7</b>	<b>54</b>
<b>Entity-Level Reporting Only (No Projects)</b> .....	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>51</b>	<b>NA</b>	<b>51</b>
<b>Commitment Reporting Only (No Projects or Entity-Level Data)</b> .....	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>0</b>	<b>NA</b>	<b>0</b>
<b>Total</b> .....	<b>1,942</b>	<b>212</b>	<b>2,154</b>	<b>195</b>	<b>31</b>	<b>226</b>

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. Total number of reporters includes confidential reports, which are excluded from the sum of reporters for each project type. Table excludes projects submitted in confidential reports.

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

<sup>4</sup>The total number of projects reported for 2003 has increased from 2,188 to 2,222 with the receipt of 7 additional reports after the database used to prepare the annual report and Public Use Database for 2003 was finalized. See note to Table 3.

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 emission reductions and carbon sequestration achieved by such long-lived projects on a yearly basis.

The principal objective of the majority of projects (1,056 or 49 percent) reported for 2004 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 cited project objectives included increasing carbon sequestration (493 or 23 percent), reducing methane and nitrous oxide emissions (463 or 21 percent), and reducing emissions of halogenated substances (41 or 2 percent). Projects that also primarily reduced carbon dioxide emissions included the 101 "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 90 foreign projects reported for 2004, 52 represented shares in two forestry programs in Belize and Malaysia sponsored by the electric power industry.

Total project-level emission reductions reported included 277.0 million metric tons carbon dioxide equivalent (million MTCO<sub>2</sub>e) in direct reductions, 91.7 million MTCO<sub>2</sub>e in indirect reductions, 7.2 million MTCO<sub>2</sub>e in carbon sequestration, and 13.8 million MTCO<sub>2</sub>e 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 214.7 million MTCO<sub>2</sub>e, indirect reductions of 45.6 million MTCO<sub>2</sub>e, and unspecified reductions of 13.1 million MTCO<sub>2</sub>e. The vast majority of the reported emission reductions were carbon dioxide reductions.

Reporters submitted information on a variety of efforts to reduce emissions of gases with high GWPs, including 463 projects with the objective of reducing methane and nitrous oxide emissions. The projects focused on waste management systems, animal husbandry operations, oil and gas systems, or coal mines. Reported net direct emission reductions from the 463 projects totaled 55.3 million MTCO<sub>2</sub>e, representing 20 percent of the total direct reductions reported for 2004. The estimate of net reductions includes 62.3 million MTCO<sub>2</sub>e in direct reductions of methane emissions, offset by increases of 7.1 million MTCO<sub>2</sub>e in carbon dioxide and nitrous oxide emissions. Indirect reductions reported for projects that reduced methane and nitrous oxide emissions totaled 45.8 million MTCO<sub>2</sub>e. Unspecified

**Table 3. Geographic Scope of Reports Received and Location of Emission Reduction Projects, Data Years 1994-2004**

Year	Reports Received					Projects Reported <sup>b</sup>			
	U.S. Only		Foreign Only	Both U.S. and Foreign	Total <sup>a</sup>	U.S. Only		Foreign Only	Total <sup>a</sup>
	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 . . . . .	156	35	3	39	234	1,708	253	94	2,055
2003 <sup>(R)</sup> . . .	163	35	2	40	241	1,900	226	96	2,222
2004 . . . . .	157	31	3	34	226	1,852	212	90	2,154

<sup>a</sup>Totals are greater than the sum of the components because the latter exclude information from confidential reports.

<sup>b</sup>Excludes projects submitted in confidential reports.

(R) = revised.

Notes: The number of reports received for 2003 was revised to reflect the receipt of 7 reports after the finalization of the Public Use Database for last year's annual report. The number of projects reported for 2003 has also been revised to reflect the projects included in those reports.

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

reductions of methane and nitrous oxide reported on the short form totaled 0.6 million MTCO<sub>2</sub>e.

Almost all of the 493 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 23 percent of the projects reported for 2004; however, 316 of the reported carbon sequestration projects represented shares in 13 projects conducted by the UtiliTree Carbon Company and the PowerTree Carbon Company, which were reported by 34 participating electric utilities.<sup>5</sup> Carbon sequestration projects reported on the long form for 2004 accounted for 7.2 million MTCO<sub>2</sub>e in carbon sequestration.

Projects with the objective of reducing emissions of halogenated substances—including perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and hydrofluorocarbons (HFCs)—reported direct reductions of 7.0 million MTCO<sub>2</sub>e for 2004, which included 4.1 million MTCO<sub>2</sub>e of PFC emissions and 2.9 million MTCO<sub>2</sub>e of SF<sub>6</sub> emissions, as well as indirect reductions of 0.3 MTCO<sub>2</sub>e, the vast majority of which was SF<sub>6</sub>.

Total direct emission reductions reported for 2004 increased by 2.8 percent over the reductions reported for 2003, to 277 million MTCO<sub>2</sub>e (Table 5), and have quadrupled since the first year of the program (data year 1994). Reported direct reductions of carbon dioxide emissions increased by 17.9 million metric tons, while direct reductions of methane emissions decreased by 11.2 million metric tons. Indirect emission reductions

### 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 (CO<sub>2</sub>), 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 CO<sub>2</sub>. 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 <sup>a</sup>
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 <sub>4</sub> ) . . . . .	5,700
Perfluoroethane (C <sub>2</sub> F <sub>6</sub> ) . . . . .	11,900
Perfluoropropane (C <sub>3</sub> F <sub>8</sub> ) . . . . .	8,600
Sulfur Hexafluoride (SF <sub>6</sub> ) . . . . .	22,200

<sup>a</sup>Intergovernmental Panel on Climate Change, *Climate Change 2001: The Scientific Basis. Summary for Policymakers* (Cambridge, UK: Cambridge University Press, 2001).

<sup>5</sup>Twenty-four electric utilities submitted reports on 10 ongoing UtiliTree Carbon Company projects. Twenty-four electric utilities, including 14 UtiliTree participants, submitted reports on 3 new PowerTree Carbon Company projects.

**Table 4. Summary of Reported Project-Level Emission Reductions and Carbon Sequestration by Reduction Objective and Gas, Data Year 2004**  
(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	
<b>Direct</b>					
Carbon Dioxide . . . . .	211,260,910	-7,040,342 <sup>a</sup>	3,982	—	204,224,550
Methane . . . . .	3,449,468	62,316,144	—	—	65,765,612
Nitrous Oxide . . . . .	24,156	-23,899 <sup>a</sup>	—	—	257
HFCs . . . . .	—	—	—	—	—
PFCs . . . . .	3,427	—	—	4,084,257	4,087,684
SF <sub>6</sub> . . . . .	—	—	—	2,944,079	2,944,079
<b>Total Direct . . . . .</b>	<b>214,737,961</b>	<b>55,251,904</b>	<b>3,982</b>	<b>7,028,337</b>	<b>277,022,183</b>
<b>Indirect</b>					
Carbon Dioxide . . . . .	45,462,942	17,027,530	41	—	62,490,513
Methane . . . . .	87,914	28,680,171	—	—	28,768,086
Nitrous Oxide . . . . .	57,218	121,374	—	—	178,593
HFCs . . . . .	—	—	—	10,900	10,900
PFCs . . . . .	34,948	—	—	—	34,948
SF <sub>6</sub> . . . . .	—	—	—	258,616	258,616
<b>Total Indirect . . . . .</b>	<b>45,643,023</b>	<b>45,829,075</b>	<b>41</b>	<b>269,515</b>	<b>91,741,655</b>
<b>Sequestration</b>					
Carbon Dioxide . . . . .	—	—	7,236,120	—	7,236,120
Methane . . . . .	—	—	—	—	—
Nitrous Oxide . . . . .	—	—	—	—	—
HFCs . . . . .	—	—	—	—	—
PFCs . . . . .	—	—	—	—	—
SF <sub>6</sub> . . . . .	—	—	—	—	—
<b>Total Sequestration . . . . .</b>	<b>—</b>	<b>—</b>	<b>7,236,120</b>	<b>—</b>	<b>7,236,120</b>
<b>Unspecified<sup>b</sup></b>					
Carbon Dioxide . . . . .	13,038,063	70,875	84,970	—	13,193,908
Methane . . . . .	3,421	571,286	—	—	574,707
Nitrous Oxide . . . . .	19	—	—	—	19
HFCs . . . . .	—	—	—	—	—
PFCs . . . . .	2	—	—	—	2
SF <sub>6</sub> . . . . .	22,154	—	—	—	22,154
<b>Total Unspecified . . . . .</b>	<b>13,063,659</b>	<b>642,160</b>	<b>84,970</b>	<b>—</b>	<b>13,790,789</b>

<sup>a</sup>Negative reductions represent increases in emissions.

<sup>b</sup>Unspecified 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. Table excludes projects submitted in confidential reports.

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

**Table 5. Summary of Reported Project-Level Emission Reductions and Carbon Sequestration by Gas, Data Years 1994-2004**  
(Metric Tons Carbon Dioxide Equivalent)

Year	Carbon Dioxide	Methane	Nitrous Oxide	HFCs	PFCs	Sulfur Hexafluoride	Total
<b>Direct</b>							
1994 . . . .	58,413,709	576,808	339,485	-29	3,199,649	83,579	<b>62,613,201</b>
1995 . . . .	85,419,479	194,350	-438,673	-43	2,962,416	186,382	<b>88,323,910</b>
1996 . . . .	77,601,577	9,411,042	-423,599	15,193	3,345,811	-69,985	<b>89,880,039</b>
1997 . . . .	82,269,887	8,705,355	86,294	-42	3,318,600	516,732	<b>94,896,824</b>
1998 . . . .	112,038,605	31,720,732	109,560	-1,738	3,504,380	624,786	<b>147,996,326</b>
1999 . . . .	115,366,719	35,994,030	62,111	-1,738	3,425,480	595,379	<b>155,441,981</b>
2000 . . . .	144,096,233	61,945,794	114,198	—	3,233,612	1,407,347	<b>210,797,186</b>
2001 . . . .	159,129,312	81,569,042	711,633	—	3,606,813	2,475,144	<b>247,491,944</b>
2002 . . . .	178,393,155	80,073,702	-4,713	—	3,562,893	3,043,682	<b>265,068,719</b>
2003 <sup>(R)</sup> . . .	186,372,727	76,992,928	14,025	—	3,550,504	2,611,910	<b>269,542,095</b>
2004 . . . .	204,224,550	65,765,612	257	—	4,087,684	2,944,079	<b>277,022,183</b>
<b>Indirect</b>							
1994 . . . .	2,994,405	2,360,734	2,243	—	—	—	<b>5,357,381</b>
1995 . . . .	27,063,660	24,777,246	630,358	—	—	7,653	<b>52,478,917</b>
1996 . . . .	26,207,709	26,612,114	616,075	—	—	—	<b>53,435,898</b>
1997 . . . .	25,848,951	11,630,239	102,639	—	3,631	81	<b>37,585,541</b>
1998 . . . .	27,968,865	15,152,664	105,598	—	6,068	81	<b>43,233,274</b>
1999 . . . .	37,233,635	19,027,769	270,531	—	5,856	81	<b>56,537,872</b>
2000 . . . .	41,276,444	20,641,700	115,689	—	35,459	81	<b>62,069,372</b>
2001 . . . .	48,255,932	23,216,197	154,566	—	34,319	81	<b>71,661,094</b>
2002 . . . .	55,347,688	24,555,786	164,214	47	36,705	81	<b>80,104,520</b>
2003 <sup>(R)</sup> . . .	55,758,258	23,091,669	177,423	38,702	237,390	2,184,750	<b>81,488,191</b>
2004 . . . .	62,490,513	28,768,086	178,593	10,900	34,948	258,616	<b>91,741,655</b>
<b>Sequestration</b>							
1994 . . . .	746,545	—	—	—	—	—	<b>746,545</b>
1995 . . . .	1,190,754	—	—	—	—	—	<b>1,190,754</b>
1996 . . . .	8,676,591	—	—	—	—	—	<b>8,676,591</b>
1997 . . . .	9,849,807	—	—	—	—	—	<b>9,849,807</b>
1998 . . . .	12,490,927	—	—	—	—	—	<b>12,490,927</b>
1999 . . . .	9,623,599	—	—	—	—	—	<b>9,623,599</b>
2000 . . . .	9,011,117	—	—	—	—	—	<b>9,011,117</b>
2001 . . . .	7,956,823	—	—	—	—	—	<b>7,956,823</b>
2002 . . . .	7,296,516	—	—	—	—	—	<b>7,296,516</b>
2003 <sup>(R)</sup> . . .	7,731,329	—	—	—	—	—	<b>7,731,329</b>
2004 . . . .	7,236,120	—	—	—	—	—	<b>7,236,120</b>
<b>Unspecified<sup>a</sup></b>							
1994 . . . .	3,721,047	564,022	—	—	—	—	<b>4,285,069</b>
1995 . . . .	4,959,366	1,162,752	—	—	—	—	<b>6,112,117</b>
1996 . . . .	4,436,523	1,232,174	—	—	—	—	<b>5,668,697</b>
1997 . . . .	6,688,175	1,825,383	—	—	123,049	—	<b>8,636,607</b>
1998 . . . .	16,499,427	2,918,818	—	—	—	—	<b>19,418,245</b>
1999 . . . .	9,607,428	3,273,878	—	—	—	4,783	<b>12,886,089</b>
2000 . . . .	9,125,506	3,127,762	—	—	—	20,744	<b>12,274,012</b>
2001 . . . .	10,855,046	3,960,348	—	—	4,046	20,261	<b>14,839,701</b>
2002 . . . .	12,820,322	4,295,112	—	—	130,930	10,201	<b>17,256,565</b>
2003 <sup>(R)</sup> . . .	12,531,743	3,835,371	—	—	1,910	28,649	<b>16,397,672</b>
2004 . . . .	13,193,908	574,707	19	—	2	22,154	<b>13,790,789</b>

(R) = revised.

<sup>a</sup>Unspecified 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.

reported for 2004, at 92 million MTCO<sub>2</sub>e, were 10.3 million MTCO<sub>2</sub>e (12.6 percent) higher than those reported for 2003.

Reported sequestration, after peaking at 12.5 million MTCO<sub>2</sub>e for 1998, has fallen below 10 million MTCO<sub>2</sub>e for the past 6 years. The decline has resulted from a decrease in, or discontinuation 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 2004, which include reductions and sequestration reported on the short form, totaled 13.8 million MTCO<sub>2</sub>e, a decrease of 15.9 percent from 2003.

### 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 2004 on Form EIA-1605, 94 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 2004 was greatest for projects that reported reducing emissions of halogenated substances (50 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 2004, reporters indicated that they used modified reference cases for 269 million MTCO<sub>2</sub>e (97 percent of total direct reductions), 85 million MTCO<sub>2</sub>e in indirect reductions (93 percent of total indirect reductions), and 7 million MTCO<sub>2</sub>e in sequestration (93 percent of total sequestration) (Table 7). The halogenated substance category was the only project category for which entities reported using basic reference

**Table 6. Number of Projects Reported on Form EIA-1605 by Reduction Objective, Project Type, and Reference Case Employed, Data Year 2004**  
(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	
<b>Reducing Carbon Dioxide Emissions.</b> . . . . .	<b>837</b>	<b>93</b>	<b>60</b>	<b>7</b>	<b>897</b>
Electricity Generation, Transmission, and Distribution . . . . .	461	98	8	2	469
Cogeneration and Waste Heat Recovery . . . . .	17	94	1	6	18
Energy End Use . . . . .	299	87	46	13	345
Transportation and Offroad Vehicles . . . . .	60	92	5	8	65
<b>Reducing Methane and Nitrous Oxide Emissions.</b> . . . . .	<b>436</b>	<b>98</b>	<b>7</b>	<b>2</b>	<b>443</b>
Waste Treatment and Disposal (Methane) . . . . .	399	99	4	1	403
Agriculture (Methane and Nitrous Oxide) . . . . .	2	100	0	0	2
Oil and Natural Gas Systems and Coal Mining (Methane) . . . . .	35	92	3	8	38
<b>Carbon Sequestration</b> . . . . .	<b>464</b>	<b>97</b>	<b>14</b>	<b>3</b>	<b>478</b>
<b>Halogenated Substances.</b> . . . . .	<b>20</b>	<b>50</b>	<b>20</b>	<b>50</b>	<b>40</b>
<b>Other Emission Reduction Projects</b> . . . . .	<b>74</b>	<b>88</b>	<b>9</b>	<b>11</b>	<b>84</b>
<b>Total.</b> . . . . .	<b>1,831</b>	<b>94</b>	<b>110</b>	<b>6</b>	<b>1,942</b>

Notes: Excludes projects reported on the short form (Form EIA-1605EZ), which does not collect information on the reference case employed. Excludes three 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.

cases for a significant proportion (91 percent or 6.4 million MTCO<sub>2</sub>e) of the direct reductions.

## Entity Level

Most of the 122 reporters providing entity-level information included data on emissions as well as emission reductions or sequestration. In addition, 7 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 2004 were 934 million MTCO<sub>2</sub>e, representing a 4-percent increase from the direct emissions reported for 2003 (Table 8). Total entity-level indirect emissions reported for 2004 were 29 percent lower than those reported for 2003, at 75 million MTCO<sub>2</sub>e. Total direct emission reductions reported at the entity level for 2004 (208 million MTCO<sub>2</sub>e) were 3 percent lower than those reported for 2003 (215 million MTCO<sub>2</sub>e). For 2004, 181 million MTCO<sub>2</sub>e (87 percent) of the reported direct reductions were estimated using modified reference cases, and 27 million MTCO<sub>2</sub>e (13 percent) were estimated with basic reference cases.

Reported entity-level indirect emission reductions for 2004 totaled 48 million MTCO<sub>2</sub>e, 12 percent higher than

the total reported for 2003. Reported indirect reductions of 49 million MTCO<sub>2</sub>e calculated with modified reference cases were offset by -1 million MTCO<sub>2</sub>e of indirect reductions (i.e., a net increase in emissions) calculated with basic reference cases. Entity-level sequestration reported for 2004 totaled 7 million MTCO<sub>2</sub>e, unchanged from that reported for 2003.

## Commitments

For 2004, 86 entities reported formal commitments to reduce emissions, take specific action to reduce emissions, or provide financial support for activities related to greenhouse gas reductions,<sup>6</sup> nearly one-third (30 percent) of which were electricity generators that participated in DOE's Climate Challenge Program (Figure 3). Reporters continued to include in their 2004 reports commitments related to Climate Challenge and other programs, such as EPA's Climate Wise and Green Lights, which are no longer active and have been subsumed by newer programs. In addition to various ENERGY STAR programs, other voluntary programs represented among the commitments reported for 2004 included the EPA's Climate Leaders Program, the EPA's Voluntary Aluminum Industrial Program, the U.S. Initiative on Joint Implementation, the EPA's Landfill Methane Outreach Program, DOE's Motor Challenge,

**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 2004**  
(Million Metric Tons Carbon Dioxide Equivalent)

Reduction Objective and Project Type	Direct Reductions		Indirect Reductions		Sequestration	
	Modified	Basic	Modified	Basic	Modified	Basic
<b>Reducing Carbon Dioxide Emissions.</b> . . . . .	<b>197.6</b>	<b>1.1</b>	<b>32.9</b>	<b>0.1</b>	<b>NA</b>	<b>NA</b>
Electricity Generation, Transmission, and Distribution . . . . .	171.5	0.5	18.1	*	NA	NA
Cogeneration and Waste Heat Recovery . . . . .	1.7	*	0.8	—	NA	NA
Energy End Use . . . . .	21.7	0.6	13.7	0.1	NA	NA
Transportation and Offroad Vehicles . . . . .	2.7	*	0.2	*	NA	NA
<b>Reducing Methane and Nitrous Oxide Emissions.</b>	<b>54.8</b>	<b>0.4</b>	<b>44.7</b>	<b>1.1</b>	<b>NA</b>	<b>NA</b>
Waste Treatment and Disposal (Methane) . . . . .	42.3	0.4	44.7	1.1	NA	NA
Agriculture (Methane and Nitrous Oxide) . . . . .	*	—	*	—	NA	NA
Oil and Natural Gas Systems and Coal Mining (Methane) . . . . .	12.5	*	—	—	NA	NA
<b>Carbon Sequestration</b> . . . . .	<b>*</b>	<b>—</b>	<b>*</b>	<b>—</b>	<b>6.8</b>	<b>0.5</b>
<b>Halogenated Substances.</b> . . . . .	<b>0.7</b>	<b>6.4</b>	<b>0.2</b>	<b>*</b>	<b>NA</b>	<b>NA</b>
<b>Other Emission Reduction Projects.</b> . . . . .	<b>16.1</b>	<b>—</b>	<b>7.4</b>	<b>5.2</b>	<b>NA</b>	<b>NA</b>
<b>Total.</b> . . . . .	<b>269.2</b>	<b>7.9</b>	<b>85.3</b>	<b>6.5</b>	<b>6.8</b>	<b>0.5</b>

\*Less than 0.05 million MTCO<sub>2</sub>e. — = Not reported. NA = not applicable.

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.

<sup>6</sup>Formal commitments in one or more of the entity-level, project-level, or financial categories accommodated by Form EIA-1605 were reported by 76 companies. Descriptions of future activities were provided by 10 companies in the Additional Information section of Schedule IV.

the EPA's Sulfur Hexafluoride Emissions Reduction Partnership for Electric Power Systems, DOE's Cool Communities Program, and EPA's Natural Gas Star.

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 2004, 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 2004, companies reported commitments to reduce entity-level emissions by a total of 81 million MTCO<sub>2</sub>e, including 13 commitments, representing 61 million MTCO<sub>2</sub>e or 76 percent of the emission reductions promised, that were to be fulfilled by 2004. The 13 other entity-level commitments, which promised reductions totaling 19 million MTCO<sub>2</sub>e, were to be fulfilled by 2005 or later.

Commitments to undertake 107 individual emission reduction projects were reported by 20 companies. Some of the commitments were linked to results from projects already underway; others were for projects not yet begun. Reporters indicated that the projects were expected to reduce future emissions or increase carbon sequestration by 63 million MTCO<sub>2</sub>e. In addition, 13 firms made 29 financial commitments. Entities promised a total of \$19 million and spent \$1.1 million of that total in 2004.

## Status of Policy Initiatives

In 2004, the Bush Administration continued to develop components of its Global Climate Change Initiative, including enhancement of the Voluntary Reporting of Greenhouse Gases Program (see box on page 14). In addition, States and other organizations continued to develop greenhouse gas registry and trading programs; and the U.S. Congress considered, but did not pass, legislation relevant to greenhouse gas reporting. The developments in 2005 did not affect the reported emissions and emission reductions data for activities in 2004 discussed in this report; 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

**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 1994-2004**  
(Million Metric Tons Carbon Dioxide Equivalent)

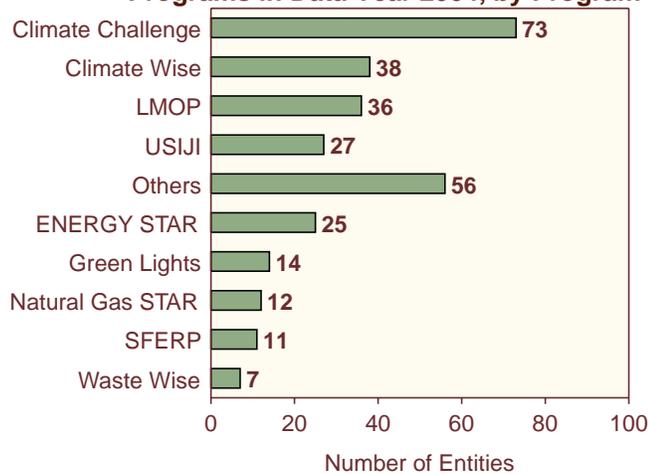
Year	Number of Entities Reporting	Emissions		Emission Reductions by Type of Reference Case						Sequestration
		Direct	Indirect	Direct			Indirect			
				Modified	Basic	Total	Modified	Basic	Total	
1994 . . . .	39	752.7	494.9	38.2	22.6	<b>60.8</b>	1.6	1.2	<b>2.8</b>	0.5
1995 . . . .	50	875.8	499.6	56.0	39.3	<b>95.3</b>	46.0	2.7	<b>48.6</b>	0.8
1996 . . . .	55	1,183.1	461.5	65.4	44.6	<b>110.0</b>	42.9	5.7	<b>48.6</b>	7.9
1997 . . . .	60	1,006.6	525.8	73.7	20.3	<b>94.0</b>	24.8	3.4	<b>28.2</b>	7.1
1998 . . . .	76	1,110.7	473.5	105.8	22.6	<b>128.4</b>	28.3	13.2	<b>41.6</b>	11.2
1999 . . . .	83	967.9	481.0	114.7	35.3	<b>150.0</b>	30.3	8.4	<b>38.7</b>	8.4
2000 . . . .	109	1,068.2	111.7	123.6	83.0	<b>206.7</b>	34.8	-7.8	<b>27.0</b>	7.5
2001 . . . .	113	799.6	111.5	121.4	90.4	<b>211.9</b>	38.9	-6.7	<b>32.2</b>	7.5
2002 . . . .	119	889.3	111.2	148.4	83.3	<b>231.6</b>	44.2	-8.3	<b>35.9</b>	6.9
2003 <sup>(R)</sup> . .	130	899.5	106.4	183.6	31.8	<b>215.4</b>	46.0	-3.0	<b>43.0</b>	6.9
2004 . . . .	121	933.9	75.3	180.8	27.5	<b>208.3</b>	49.0	-0.8	<b>48.2</b>	6.9

(R) = revised.

Notes: 2003 data year includes 7 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 2004, 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.

expand the 1605(b) Voluntary Reporting of Greenhouse Gases Program. The primary goal of this effort is to enhance the program's credibility and transparency in reporting. 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 2005, 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 March 2005, DOE released interim final General Guidelines and draft Technical Guidelines. The guidelines outline the principles that will govern the revised program and specify the methods and factors reporters must use in measuring and estimating greenhouse gas emissions, emission reductions, and carbon sequestration under the revised Program. DOE also held a public workshop on the subject in Crystal City, Virginia, on April 26-27, 2005. The Department of Agriculture and DOE jointly sponsored a workshop on May 5, 2005, to solicit comments on the forestry- and agriculture-related provisions of the guidelines.

The General Guidelines were issued as an interim final rule to be effective on September 20, 2005; however, on September 19, 2005, DOE announced that the effective date of the guidelines would be delayed until June 1, 2006,<sup>7</sup> to allow time for DOE to finalize the guidelines. When the guidelines are finalized, EIA intends to develop new reporting forms and software. Reporting under the revised guidelines is expected to begin in 2007.

<sup>7</sup>Federal Register, Vol. 70, No. 180 (September 19, 2005), p. 54835.

## 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.