

Executive Summary

Introduction

The Voluntary Reporting of Greenhouse Gases Program, required by Section 1605(b) of the Energy Policy Act of 1992, records the results of voluntary measures to reduce, avoid, or sequester greenhouse gas emissions. For the 2004 reporting year, 226 U.S. companies and other organizations reported to the Energy Information Administration (EIA) that they had undertaken 2,154 projects to reduce or sequester greenhouse gases in 2004. The reported greenhouse gas emission reductions for the projects reported included 277 million metric tons carbon dioxide equivalent (million MTCO₂e) of direct reductions, 92 million MTCO₂e of indirect reductions,

7 million MTCO₂e of reductions from carbon sequestration, and 14 million MTCO₂e of unspecified reductions (Table ES1). Total U.S. greenhouse gas emissions in 2004 are estimated at 7,122 million MTCO₂e.¹

Direct reductions are emission reductions from sources owned or leased by the reporting entity; indirect reductions are emission reductions from sources not owned or leased by the reporting entity but that occur as a result of the entity's activities; carbon sequestration reductions represent the removal of atmospheric carbon to a carbon sink; and unspecified reductions represent emission reductions reported on Form EIA-1605EZ, which does

Table ES1. Reporting Indicators for the Voluntary Reporting of Greenhouse Gases Program, Data Years 1994-2004

Indicator	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 ^(R)	2004
Number of Entities Reporting	108	142	150	162	207	207	236	232	234	234	226
Number of Projects Reported	634	960	1,040	1,288	1,549	1,722	2,089	1,897	2,055	2,222	2,154
Number of Entity-Level Reports Received	40	51	56	60	76	83	108	114	119	130	122
Project-Level Reductions Reported (Million Metric Tons Carbon Dioxide Equivalent)											
Direct ^a	63	88	90	95	148	155	211	247	265	270	277
Modified Reference Case ^b	59	76	75	88	127	126	176	209	257	262	277
Basic Reference Case ^c	4	13	15	7	21	29	35	38	8	7	*
Indirect ^d	5	52	53	38	43	57	62	72	80	81	92
Modified Reference Case ^b	5	52	51	36	38	51	57	61	78	75	85
Basic Reference Case ^c	0	1	3	2	5	6	5	11	2	6	6
Sequestration ^e	1	1	9	10	12	10	9	8	7	8	7
Unspecified ^f	4	6	6	9	19	13	12	15	17	16	14

^a"Direct" emission reductions are reductions in releases of greenhouse gases "on site." For the purpose of completing Form EIA-1605, "on site" is defined as any source owned (wholly or in part) or leased by the reporting entity.

^bIn a "modified reference case," actual emissions (or sequestration) are compared to an estimate of what emissions (or sequestration) would have been in the absence of the project.

^cIn a "basic reference case," actual emissions (or sequestration) are compared with an estimate of historical emissions (or sequestration) in a particular base year or an average of up to 4 years.

^d"Indirect" emission reductions are reductions in emissions from sources not owned or leased by the reporting entity but that occur, wholly or in part, as a result of the entity's activities (for example, an automobile manufacturer's investment in increased automotive fuel economy can result in decreased emissions from vehicles owned by individuals or managed fleets).

^e"Sequestration" is the fixation of atmospheric carbon dioxide in a carbon sink through biological or physical processes, such as photosynthesis.

^f"Unspecified" emission reductions represent quantities reported on the short form (Form EIA-1605EZ) for which the reporting entity did not specify whether the emission reduction or carbon sequestration was direct or indirect.

*Less than 0.5 million MTCO₂e. (R) = revised.

Notes: 2003 data have been revised to include reports that were submitted after the filing deadline. It is expected that the 2004 data will also be revised upward in next year's report with the inclusion of late 2004 reports. Totals for direct and indirect reductions may not equal sum of components due to independent rounding.

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

¹Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2004*, DOE/EIA-0573(2004) (Washington, DC, December 2005), web site www.eia.doe.gov/oiaf/1605/ggrrpt.

not allow the reporter to specify whether the emission reduction was a direct or indirect reduction.

To calculate reported emission reductions, reporters are allowed to use a “basic” reference case or a “modified” reference case. A reference case is an emissions or sequestration level that is compared against actual emissions in order to estimate emission reductions. A “basic” reference case uses actual historical emissions (or sequestration) in a specific year, or an average of a range of years. In a “modified” reference case, an estimate is made of what emissions or sequestration would have been in the absence of the project.

Generally, as illustrated in Table ES1, most reductions are reported relative to a modified reference case. For 2004, nearly all (99.8 percent) of the of the total 277 million MTCO₂e of reported direct reductions was based on modified reference cases. For reported indirect reductions, 85 million MTCO₂e, or 93 percent, of the total 92 million MTCO₂e of reported indirect reductions was based on modified reference cases.

The number of entities (226) reporting to the Voluntary Reporting Program for 2004 is slightly lower than the number that reported for 2003; however, the number of reporters for 2003 has been revised upward to include seven additional entities that filed late reports after the closing of the 2003 database. EIA also expects a similar upward revision in the number of 2004 reporters in next year’s report, to reflect late reporters for the 2004 reporting cycle. As of February 2006, EIA had received five additional 2004 reports and one additional 2003 report since the closing of the 2004 database in preparation for this annual report.² 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.

Since the inception of the program in 1994, the number of entities reporting to the program has grown by 109 percent, when 108 entities reported. The number of reported projects has grown at a more rapid rate than the number of reporters, because the number of projects reported by repeat reporters has increased. The 2,154 projects reported for 2004 represent an increase of 234 percent over the 645 projects reported in 1994 but a 3-percent decline from the final total of 2,224 projects reported for 2003.

Of the 226 organizations reporting for 2004, 122 provided entity-level reports, including estimates of emissions and/or emission reductions for their entire

organizations. In addition, 86 of the reporters for 2004 recorded commitments to take action to reduce emissions in the future.

Of the 122 organizations reporting at the entity level, 116 estimated their 2004 entity-level greenhouse gas emissions. These entities reported direct greenhouse gas emissions of 934 million MTCO₂e, equal to about 13 percent of total U.S. greenhouse gas emissions in 2004.³ They also reported 75 million MTCO₂e of indirect emissions, equal to about 1 percent of total U.S. greenhouse gas emissions in 2004. Of the 122 entity-level reporters, 115 also reported emission reductions, including 208 million MTCO₂e of direct emission reductions, 48 million MTCO₂e of indirect emission reductions, and 7 million MTCO₂e of emission reductions resulting from carbon sequestration projects.

Participants in 24 different industries or services submitted reports for 2004, as compared with the 28 different industries or services reporting for 2003. The number of different industries represented continues to be higher than it was in the first year of the program (1994 data year), when the 108 reports received included participants in 9 different industries or services (Table ES2). In the early years of the program, the majority of reporters came from the electric power sector. In the first reporting year, the 95 submissions from electric power producers represented 88 percent of the 108 reports received (Figure ES1). Since then, the program has seen an influx of new participants from outside the electric power sector, representing a diverse set of other industries. In addition, several mergers and acquisitions involving reporters to the program have accompanied the ongoing restructuring of the electric power industry. Many of these merged entities have submitted single, consolidated reports, thus reducing the number of reports received from electricity producers. As a result, only 42 percent of the organizations reporting to the program for 2004 (94 firms) were from the electric power sector.

Although the number of reporters from other individual industries remains relatively small, in many cases, reports were received from key companies in those other industries: for example, DaimlerChrysler Corporation, General Motors, the Ford Motor Company, Nissan North America, and Toyota North America in the automotive products industry; Noranda and an operating division of Alcan’s Primary Products in the metals industry; Sunoco, Inc., ChevronTexaco Corporation, and BP America in the petroleum industry;

²The deadline for submitting reports to EIA for inclusion in each annual edition of the Public Use Database is June 1. EIA typically grants reporters extensions to the deadline, usually until early July, before closing the database to new reports to allow analysis of the information for the annual report. EIA includes reports received after the database has been closed in the next annual edition of the Public Use Database and revises the data for that reporting year in the corresponding annual report, to reflect the addition of late reports.

³Based on total emissions from Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2004*, DOE/EIA-0573(2004) (Washington, DC, December 2005), web site www.eia.doe.gov/oiaf/1605/ggrpt.

Table ES2. 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 ^(R)	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	—	—
Total Number of Reporters		108	142	150	162	207	207	236	232	234	241^a	226
Number of 2-Digit SIC Codes Represented		9	13	16	18	24	27	31	27	29	28^a	24

^aIncludes 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.

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.

Projects Reported

Electric power sector reporters (including independent power producers) accounted for 1,489 (69 percent) of the projects reported for 2004. Also reporting were alternative energy providers (382 projects), industrial concerns (264 projects), and agriculture and forestry organizations (4 projects). Organizations in other sectors (government, commercial, and residential) submitted reports on 15 projects.

Most of the projects reported for 2004 affected energy supply or use. The electric power sector reported 518 projects that were related to the generation, transmission, or distribution of electricity (Figure ES1). Another 446 were related to energy end use, 74 were transportation projects, and 18 were cogeneration projects. Other projects reduced emissions of methane from waste

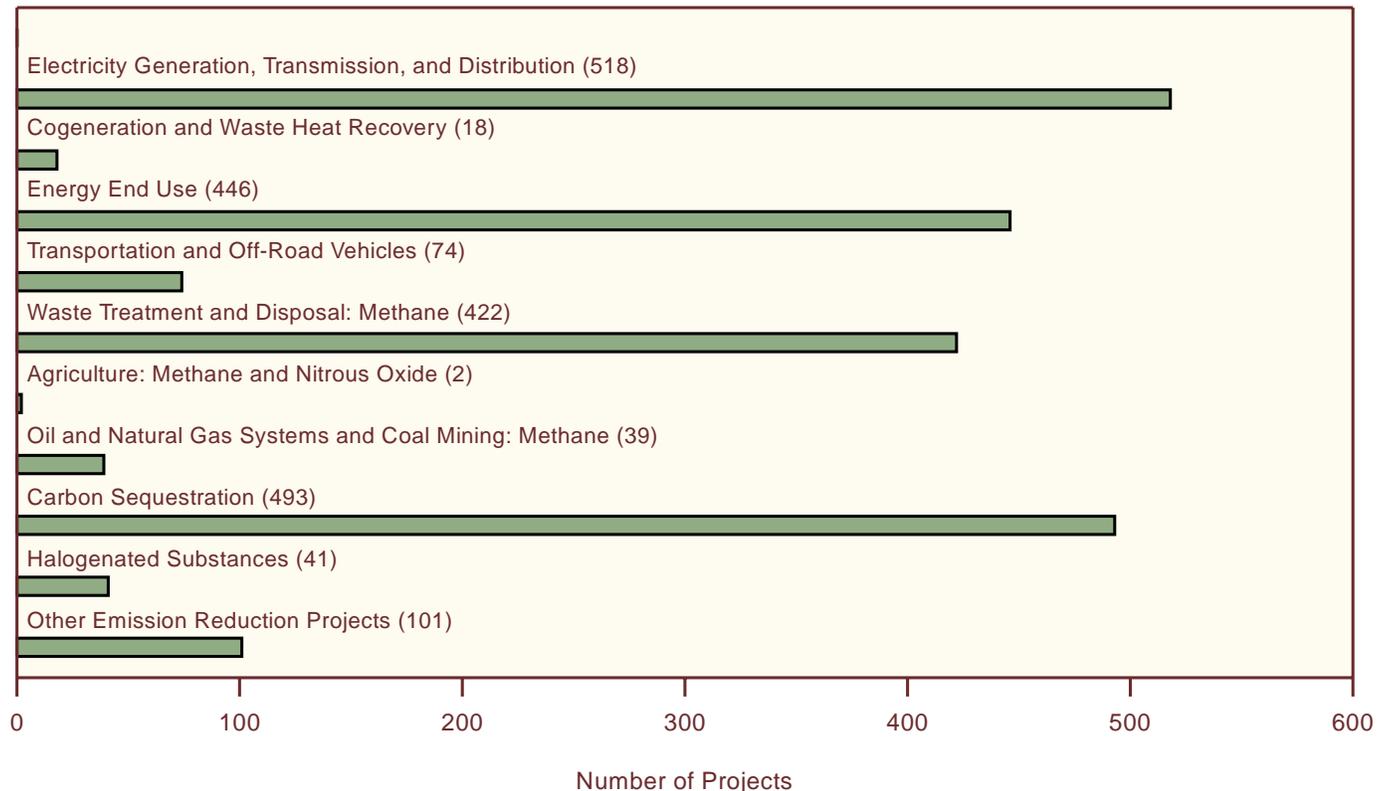
treatment and disposal facilities (422 projects), from oil and natural gas systems and coal mines (39 projects, many of which included the displacement of fossil fuels through the use of methane as a fuel), and from agricultural activities (2 projects). Other projects (101) included the reuse of fly ash in concrete and materials recycling, which reduce emissions in part by reducing energy consumption. The largest reductions were reported for projects that improved the performance of nuclear power plants. The non-energy-related projects reported fell into two major categories: sequestration of carbon, usually in forests (493 projects); and recycling, reuse, or destruction of halogenated substances, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) (41 projects).

Reductions Reported

Electric Power

For 2004, 487 electric power and cogeneration projects were reported on Form EIA-1605. Total emission reductions from electric power and cogeneration projects reported on Form EIA-1605 (the long form) included 174 million MTCO₂e from direct sources and 19 million

Figure ES1. Number of Projects Reported to the Voluntary Reporting of Greenhouse Gases Program by Project Type, Data Year 2004



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

MTCO₂e from indirect sources. There were 257 projects reported that reduced the carbon content of fuels used to generate electricity, with emission reductions totaling 160 million MTCO₂e from direct sources and 17 million MTCO₂e from indirect sources. Reported emission reductions for the 258 projects that increased energy efficiency in generation, transmission, and distribution included 18 million MTCO₂e from direct sources and 2 million MTCO₂e from indirect sources. Reporters using Form EIA-1605EZ (the short form) submitted information on another 49 electric power and cogeneration projects for 2004, with reported emission reductions from unspecified sources totaling 12 million MTCO₂e.⁴

Energy End Use and Transportation

For 2004, 410 energy end use and transportation projects were reported on Form EIA-1605, with total reported emission reductions of 25 million MTCO₂e from direct sources and 14 million MTCO₂e from indirect sources. Nearly all (93 percent) of the reported energy end-use reductions involved stationary-source applications, such as building shell improvements, lighting and lighting control, appliance improvement or replacement, and heating, ventilation and air conditioning (HVAC) improvements. Participants using the long form reported much smaller reductions for 65 transportation projects, including 2.7 million MTCO₂e from direct sources and 0.2 million MTCO₂e from indirect sources. Participants using Form EIA-1605EZ reported another 110 energy end-use and transportation projects for 2004, with total emission reductions of 0.5 million MTCO₂e.

Carbon Sequestration

Reporters submitted 478 carbon sequestration⁵ projects on Form EIA-1605 for 2004, with total reported sequestration of 7 million MTCO₂e. Most of the reported reductions resulted from afforestation, reforestation, urban

forestry, forest management, and forest preservation efforts. Another 15 carbon sequestration projects were reported on Form EIA-1605EZ, for which about 85,000 MTCO₂e of sequestered carbon was reported.

Methane and Nitrous Oxide Emissions

Emission reductions for the 443 methane and nitrous oxide abatement projects reported for 2004 on the 2004 EIA-1605 included 55 million MTCO₂e from direct sources and 46 million MTCO₂e from indirect sources. The three most frequently reported sources of methane reductions were municipal waste landfills (392 projects), natural gas systems (27 projects), and coal mines (11 projects). In addition to reducing methane emissions, projects that involved the recovery and use of methane for energy also reduced carbon dioxide emissions by displacing fossil fuels, such as oil and coal, which have higher carbon contents and thus produce more carbon dioxide when burned. Reporters using the short form submitted another 20 methane or nitrous oxide reduction projects for 2004, with reported reductions of methane or nitrous oxide emissions totaling 0.6 million MTCO₂e.

Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride

A total of 41 projects were submitted on Form EIA-1605 for 2004 reporting reductions in emissions of HFCs, PFCs, and SF₆. Reductions reported for the projects included 7 million MTCO₂e from direct sources and 0.2 million MTCO₂e from indirect sources. The largest reported reductions were direct reductions of perfluoromethane, a type of PFC (3.4 million MTCO₂e); SF₆ (2.9 million MTCO₂e); and perfluoroethane, another type of PFC (0.7 million MTCO₂e). No reductions of HFCs, PFCs, or SF₆ were reported on Form EIA-1605EZ for 2004.

⁴The emission reductions reported on Form EIA-1605EZ are unspecified, because the form does not ask the reporter to distinguish between direct and indirect reductions.

⁵Carbon sequestration is the fixation of atmospheric carbon dioxide in a carbon sink through biological or physical processes.

