1. Voluntary Reporting 2002: 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] The Guidelines to the Voluntary Reporting of Greenhouse Gases Program were developed in 1994 by DOE's Office of Policy and International Affairs, 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 ninth reporting cycle of the Voluntary Reporting Program, including reported information on emissions, emission reductions, and carbon sequestration activities through 2002. 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 (available on web site *http://www.eia.doe.gov/oiaf/1605/vrrpt/index.html*) 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 *http://www.eia.doe.gov/oiaf/1605/database.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 benefits of the Voluntary Reporting Program are:[2]

- 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.
- The program has helped to provide concrete evidence for the evaluation of activities reported to the many government voluntary programs launched since 1993.

[1]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.

[2]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.

- 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 2002 data year were received from 228 participants in 29 different industries or services (defined by the two-digit Standard Industrial Classification code), an increase from the 26 different industries represented among 2001 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

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.

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 electric power sector, representing a diverse set of other industries. In addition, the ongoing restructuring of the electric power industry has been accompanied by several mergers and acquisitions involving reporters to the program, reducing the number of reports received from electricity producers. As a result, only 43 percent of the organizations reporting to the program for data year 2002 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

Table 1. Forms Filed by Standard Industrial Classification, Data Years 1994-2002
(Number of Reports)

SIC Code[a]	Description	Data Year								
		1994	1995	1996	1997	1998	1999	2000	2001[(R)]	2002
01	Agricultural Production: Crops	0	0	0	0	1	0	0	1	0
08	Forestry	1	2	1	1	3	3	1	0	1
12	Coal Mining	1	2	2	1	4	3	4	6	7
14	Nonmetallic Minerals, Except Fuels	0	0	0	0	1	1	0	0	0
20	Food and Kindred Products	0	0	0	0	1	2	6	4	4
22	Textile Mill Products	0	0	0	0	0	1	5	11	12
23	Apparel and Other Textile Products	0	0	0	0	0	0	1	1	2
24	Lumber and Wood Products	0	0	0	0	0	0	1	1	0
25	Furniture and Fixtures	0	0	0	0	0	0	1	1	1
26	Paper and Allied Products	0	0	0	0	0	1	1	0	0
27	Printing and Publishing	0	1	0	1	0	1	1	0	0
28	Chemicals and Allied Products	1	3	2	3	8	5	11	9	10
29	Petroleum Refining and Other Related Industries	0	0	2	3	8	9	8	7	6
30	Rubber and Miscellaneous Plastic Products	0	0	0	0	0	0	2	2	2
32	Stone, Clay, Glass, and Concrete Products	0	0	1	4	12	13	7	5	2
33	Primary Metals Industries	2	2	4	4	5	5	5	11	11
34	Fabricated Metal Products, Except Machinery and Transportation Equipment	0	2	1	1	3	1	1	1	1
35	Industrial and Commercial Equipment and Components	0	0	0	0	0	0	1	1	1
36	Electronic and Other Electrical Equipment	1	1	2	4	4	4	9	9	8
37	Transportation Equipment	1	1	1	2	3	5	6	7	8
38	Instruments and Related Products	0	0	0	0	2	0	1	1	1
39	Miscellaneous Manufacturing Industries	0	1	1	0	2	2	1	1	1
48	Communications	0	0	0	0	0	1	0	0	1
49	Electric, Gas, and Sanitary Services	95	121	125	129	138	135	151	145	138
51	Wholesale Trade: Nondurable Goods	0	0	0	0	0	0	0	0	1
57	Furniture and Home Furnishings Stores	0	0	0	0	2	1	1	0	1
65	Real Estate	0	1	1	1	1	1	1	1	1
67	Holding and Other Investment Offices	0	0	1	1	1	1	1	1	1
72	Personal Services	0	0	0	0	0	0	1	1	1
80	Health Services	0	0	0	0	1	0	0	0	0
82	Educational Services	1	2	2	2	0	2	0	0	0
86	Membership Organizations	0	0	0	1	1	1	1	0	1
87	Engineering and Management Services	0	0	2	2	2	1	0	1	0
88	Private Households	2	1	1	1	1	1	1	1	1
89	Services Not Elsewhere Classified	0	0	0	1	1	3	2	1	1
91	Executive, Legislative, and General	0	0	0	0	1	2	2	2	1
97	National Security and International Affairs	0	0	0	0	0	0	1	0	0
99	Nonclassifiable Establishments	0	0	0	0	0	0	0	0	1
Total Number of Reporters[b]		**108**	**142**	**150**	**162**	**207**	**207**	**236**	**232[c]**	**228[c]**
Number of 2-Digit SIC Codes Represented		**9**	**13**	**16**	**18**	**24**	**26**	**30**	**26[c]**	**29[c]**

[a]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 2004 data year reporting cycle, EIA intends 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.

[b]Totals may be greater than the sum of reporters in each SIC code, because confidential reporters are excluded from the latter.

[c]Includes 4 late reports for the 2001 data year. The 2002 total will also be revised upward in next year's report with the inclusion of late 2002 reports. As of January 27, 2004, EIA had received 3 late 2002 reports, which are not included in this report's 2002 database.

(R) = Revised.

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

other industries: for example, General Motors and Ford Motor Company in the automotive products industry; Noranda and an operating division of Alcan in the metals industry; BP, 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; Pharmacia & Upjohn Caribe, Inc., in the pharmaceuticals industry; and IBM and Motorola Austin in the electronic equipment industry. A complete listing of all 2002 reporters is provided in Appendix B, Table B1.[3]

Most reporters indicated that their projects were affiliated with one or more government-sponsored voluntary programs. Of the 2,029 projects reported for 2002, 1,045 were affiliated with the Climate Challenge Program, 360 with the Landfill Methane Outreach Program, 85 with various Energy STAR programs (including Energy STAR Buildings, Energy STAR Computers, and Energy STAR Transformers), 14 with the Climate Wise Recognition Program, 38 with the U.S. Initiative on Joint Implementation, 19 with the Natural Gas STAR Program, 17 with the Green Lights Program, 9 with the Sulfur Hexafluoride Emissions Reduction Partnership, 9 with the Coalbed Methane Outreach Program, 9 with WasteWise, and 7 with Compressed Air Challenge. Other voluntary programs cited included the Voluntary Aluminum Industrial Partnership, Motor Challenge, Rebuild America, Cool Communities Program, and DOE's Partnership for Technology Introduction. Not all participants in the various voluntary programs provided information to the Voluntary Reporting Program.

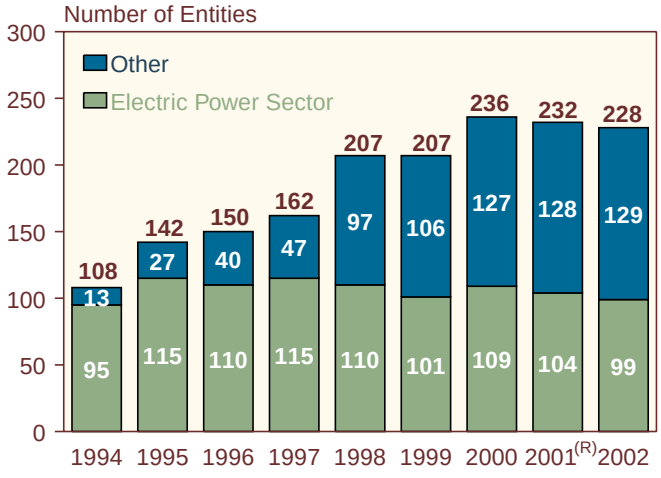
What Was Reported?

The Voluntary Reporting Program permits three distinct types of reporting:

- Project-level emissions and reductions, defined as the emission reduction consequences of a particular action
- Entity-level emissions and reductions, defined as the emissions and reductions of an entire organization, usually defined as a corporation
- Commitments to take action to reduce emissions in the future.

Of the 228 reports received, 193 (85 percent) were submitted on Form EIA-1605 (Figure 2). The remainder were submitted on Form EIA-1605EZ (the short form), which permits reporting on project-level reductions and sequestration only. The proportion of reporters using the short form has declined from 32 percent in the first year of the program (1994 data year) to 15 percent in the 2002 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

Figure 1. Electric Power Sector and Other Entities Submitting Reports to the Voluntary Reporting of Greenhouse Gases Program, Data Years 1994-2002

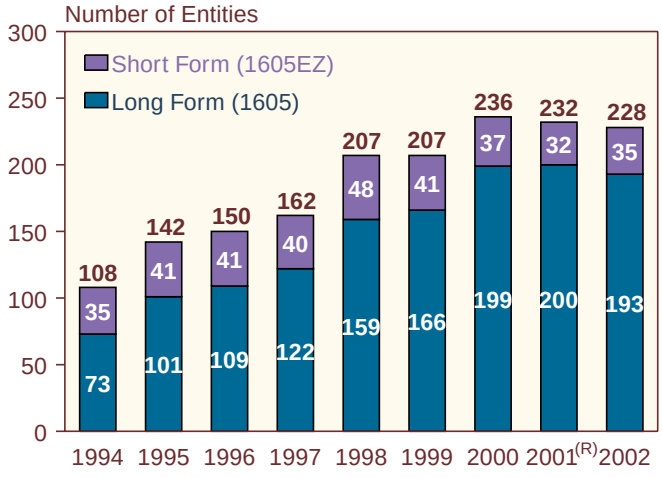


(R) = revised.

Notes: Electric power sector includes electric utilities and independent power producers. 2001 data year includes 4 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.

Figure 2. Number of Reports Received by Form Type, Data Years 1994-2002



(R) = revised.

Notes: Electric power sector includes electric utilities and independent power producers. 2001 data year includes 4 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.

[3]Appendixes for this report are available from web site www.eia.doe.gov/oiaf/1605/vrrpt/index.html.

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

Most reporters (172 or 76 percent) reported project-level reductions, and 114 reported entity-level emissions and/or reductions. Most (59) of the reporters that reported entity-level emissions or reductions also reported at the project level. One hundred twelve organizations submitted only project-level reports, whereas 55 reported only entity-level information. Seventy-nine reporters provided information on their commitments to reduce emissions or increase sequestration in the future, including one that reported only commitments.

Sources of greenhouse gas emissions and emission reductions reported to the Voluntary Reporting Program are characterized as direct, indirect, or unspecified. The unspecified category includes carbon sequestration reported on the long form and all reductions and sequestration reported on the short form. Because of concern about possible double counting (see box on page 6), EIA does not aggregate reported emissions or emission reductions across the three categories.

Project Level

Reporters provided information on a total of 2,027 projects for 2002 (Table 2). Most of these projects (1,774 or 88 percent) were reported on the long form. The total number of projects reported increased by 130, or 7 percent, compared with the previous reporting cycle.[4] Most of the 2,027 projects reported for 2002 were also among the 1,897 projects reported for 2001, because they continued to yield emission reductions. Projects often yield emission reductions over an extended period of time; 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. A project may even involve no new activity. 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.

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). Sixty of the 94 foreign projects reported for 2002 represent shares in two forestry programs in Belize and Malaysia sponsored by the electric utility industry.

The principal objective of the majority of projects reported for 2002 was to reduce carbon dioxide emissions (Table 2). Most of these projects 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

Table 2. Distribution of Projects by Reduction Objective, Project Type, and Form Type, Data Year 2002

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	**793**	**165**	**958**	**171**	**51**	**222**
Electricity Generation, Transmission, and Distribution	398	58	456	65	25	90
Cogeneration and Waste Heat Recovery	20	1	21	12	1	13
Energy End Use	315	97	412	62	20	82
Transportation and Offroad Vehicles	60	9	69	32	5	37
Reducing Methane and Nitrous Oxide Emissions	**246**	**51**	**297**	**75**	**7**	**82**
Waste Treatment and Disposal (Methane)	403	49	452	52	5	57
Agriculture (Methane and Nitrous Oxide)	3	0	3	3	0	3
Oil and Natural Gas Systems and Coal Mining (Methane)	39	2	41	20	2	22
Carbon Sequestration	**412**	**14**	**426**	**50**	**11**	**61**
Halogenated Substances	**42**	**2**	**44**	**29**	**2**	**31**
Other Emission Reduction Projects	**82**	**21**	**103**	**46**	**10**	**56**
Entity-Level Reporting Only (No Projects)	**NA**	**NA**	**NA**	**55**	**NA**	**55**
Commitment Reporting Only (No Projects or Entity-Level Data)	**NA**	**NA**	**NA**	**1**	**NA**	**1**
Total	**1,774**	**253**	**2,027**	**193**	**35**	**228**

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.

[4]The total number of projects reported for 2001 has increased from 1,705 to 1,897 due to the receipt of 4 additional reports after the time the database used to prepare the annual report and Public Use Database for 2001 was finalized. See note to Table 3.

Double Reporting of Emission Reductions

Double reporting of emission reductions to the Voluntary Reporting of Greenhouse Gases Program can occur, because the ownership rights for such reductions may be claimed by more than one party. For example, both the manufacturers and owners of more efficient automobiles can claim emission reductions resulting from the operation of those vehicles (see page 19, "Who Owns the Reduction?"). Because the purpose of the Voluntary Reporting Program is to encourage reporting, EIA does not prohibit double reporting; however, EIA does endeavor to identify instances where double reporting may occur.

Reporters are required to distinguish between direct and indirect emissions and emission reductions on Form EIA-1605. Direct emissions are releases of greenhouse gases from sources owned (wholly or in part) or leased by the reporting entity. Indirect emissions are emissions from sources not owned or leased by the reporter that occur as a result of the reporter's activities. The most important indirect emissions are those associated with the consumption of electricity purchased from an electricity generator. Because the distinction between direct and indirect is unambiguous, direct emission reductions reported to the Program should include no double reporting.

The reporting forms do not currently allow the reporter to indicate whether carbon sequestered through forestry projects is direct (occurring on land owned by the reporter) or indirect (occurring on land owned by others). Also, Form EIA-1605EZ does not distinguish between direct and indirect reductions. EIA intends to address these issues in future modifications of its reporting forms. To put this issue in perspective, of total project-level emission reductions for 2002, 72 percent (265 million metric tons carbon dioxide equivalent) are reported as direct emission reductions, 22 percent (79 million metric tons carbon dioxide equivalent) are reported as indirect emission reductions, and 7 percent (25 million metric tons carbon dioxide equivalent) are unspecified, reported as sequestration on the long form or as reductions or sequestration on the short form.

A second mechanism to identify possible double reporting is to require reporters using the long form to identify any other entity or entities that participate in a project reported to the Program. This captures situations where more than one entity is responsible for creating the emission reduction, such as landfill gas projects where the landfill owner, the owner of the power plant that uses the landfill gas, and the purchaser of the resulting power all can, and often do, report all the effects of the project. In the case of the landfill operator, for example, the methane captured at the landfill would be reported as a direct emission reduction, and the possible reduction in central-station fossil fuel power generation would be reported as an indirect emission. In contrast, the operator of the power plant could claim the emission reduction at the power plant as a direct reduction and the reduction in methane emissions at the landfill as an indirect reduction. In general, EIA believes that instances of double reporting of direct emissions are very rare if not nonexistent; however, double counting can be an issue for indirect reductions, because their ownership is not as unambiguous.

Because of the concern that double reporting could result in double counting of emission reductions, EIA has discontinued reporting the direct, indirect, and unspecified reductions reported to the Program, in order to avoid giving the impression that the totals represent the cumulative effects of U.S.-sponsored projects on worldwide emissions of greenhouse gases. Emissions, emission reductions, and sequestration are disaggregated into the following categories: direct, indirect, and unspecified reductions and sequestration. Unspecified reductions and sequestration include sequestration reported on Form EIA-1605 and reductions and sequestration reported on Form EIA-1605EZ. As in the past, EIA does not combine reductions reported at the project level with those reported at the entity level, because the reported reductions represent the results of different approaches to estimating changes in greenhouse gas emissions.

EIA does not verify greenhouse gas emission reductions reported by participants, nor does it grant a property right associated with the claimed reductions. EIA does, however, conduct a four-step desk review to see that the data submissions are comprehensive, arithmetically accurate, internally consistent, plausible, and consistent with Program guidelines. The four steps of the desk review are (1) an analyst's review, (2) electronic edit checks incorporated into the reporting software to screen for errors, (3) manual checks of the methodologies employed, and (4) followup with reporters as needed to clarify any other issues. The Program requires the participants themselves to certify that the information reported is accurate to the best of their knowledge and belief; thus, the reporters are ultimately responsible for the accuracy of the reports submitted to the Voluntary Reporting Program.

gases. A total of 958 projects involved either efficiency improvements and switching to lower emitting energy sources in the electric power industry or energy end use measures affecting stationary or mobile combustion sources. Projects that also primarily reduced carbon dioxide emissions included the 103 "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.

Projects that primarily affected carbon dioxide emissions accounted for reported direct reductions of 192 million metric tons carbon dioxide equivalent, representing 72 percent of the total direct reductions reported for 2002 on a carbon dioxide equivalent basis (Table 4). In addition, indirect reductions totaling 39 million metric tons carbon dioxide equivalent were also reported for the projects that reduced carbon dioxide emissions. A further 13 million metric tons carbon dioxide equivalent of unspecified reductions were reported on the short form, where the reporter is not asked to specify whether reductions or sequestration are direct or indirect.

Almost all of the 426 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 2002; however, 252 of the reported carbon sequestration projects represented shares in 9 projects conducted by the UtiliTree Carbon Company reported by 28 participating electric utilities. The sequestration reported for carbon sequestration projects for 2002 totaled 7 million metric tons of carbon dioxide on the long form and 10,722 metric tons of carbon dioxide on the short form. Direct emission reductions totaling 1,875 metric tons of carbon dioxide were also reported for a few projects where changes in forest management practices reduced fuel consumption.

A variety of efforts to reduce emissions of gases with high global warming potentials (GWPs) were also reported (see box on page 8). Two hundred ninety-seven of the reported projects (15 percent) reduced methane and nitrous oxide emissions from waste management systems, animal husbandry operations, oil and gas systems, or coal mines. The 76 million metric tons carbon dioxide equivalent of direct methane reductions reported were offset by reported increases in carbon dioxide and nitrous oxide emissions totaling 10 million metric tons carbon dioxide equivalent. The carbon dioxide equivalent of the net reduction in direct emissions for projects that reduced methane and nitrous oxide emissions was 67 million metric tons, which represents 25 percent of the total direct reductions reported for 2002. Indirect reductions reported for projects that reduced methane and nitrous oxide emissions totaled 40 million metric tons carbon dioxide equivalent, and unspecified reductions and sequestration reported on the short form contributed emission reductions equal to another 4 million metric tons carbon dioxide equivalent.

Forty-four projects reduced emissions of halogenated substances, including perfluorocarbons (PFCs) and

Table 3. Geographic Scope of Reports Received and Location of Emission Reduction Projects, Data Years 1994-2002

	Reports Received					Projects Reported[b]			
	U.S. Only					U.S. Only			
Year	Long Form	Short Form	Foreign Only	Both U.S. and Foreign	Total[a]	Long Form	Short Form	Foreign Only	Total[a]
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(R) . . .	155	32	1	43	**232**	1,596	210	91	**1,897**
2002	150	35	3	39	**228**	1,680	253	94	**2,027**

[a]Totals are greater than the sum of the components because the latter exclude information from confidential reports.
[b]Excludes projects submitted in confidential reports.
(R) = revised.
Notes: The number of reports received for 2001 was revised to reflect the receipt of 4 reports after the finalization of the Public Use Database for last year's annual report. For 2001, additional reports were received from Agilent Technologies, DaimlerChrysler Corporation, New York Power Authority, and Waste Management Inc. The number of projects reported for 2001 has also been revised to reflect the projects included in those reports.
Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

sulfur hexafluoride (SF_6). Unlike the years before 2001, no offsetting increases in emissions of hydrofluorocarbons (HFCs)—which are used as substitutes for chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) being phased out under the Montreal Protocol—were reported for 2002. Direct reductions of PFC and SF_6 emissions totaled 7 million metric tons carbon dioxide equivalent, representing almost all the PFC and SF_6 emission reductions reported for 2002. Reductions of other gases, including carbon monoxide (CO), nonmethane volatile organic compounds (NMVOCs), CFCs, and HCFCs, were reported, but these gases do not have reliable GWPs and are not included in the carbon dioxide equivalent data presented in this report (see box below).

Direct emission reductions reported for 2002 increased by 7 percent over the reductions reported for 2001, to 265 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 emissions increased by 12 percent, to 178 million metric tons carbon dioxide equivalent. Direct reductions of SF_6 increased by 3 percent over the levels reported for 2001. In contrast, the reported changes in nitrous oxide emissions went from a reduction of more than 700,000 metric tons carbon dioxide equivalent to an increase of 5,000 metric tons carbon dioxide equivalent. This change resulted from a revision to the method used by the Integrated Waste Services Association to estimate offsetting increases in nitrous oxide emissions resulting from the incineration of municipal solid waste (MSW). Reported reductions of indirect emissions increased by 11 percent, to 80 million metric tons carbon dioxide equivalent.

The sequestration reported peaked at 12 million metric tons for 1998 and has fallen below 10 million metric tons carbon dioxide for the three following years. This decline was caused by the decline in, or nonrecurrence of, sequestration reported for several large forest preservation initiatives. Those projects avoided carbon releases that would have been associated with logging over the time period when the forests would have been harvested, and the avoided emissions were reported as increased carbon sequestration over the same period. Also, American Forests, which reported sequestration for 164 reforestation projects for 2000, did not submit a report for 2001 or 2002. Unspecified reductions, which

Comparison of Global Warming Potentials from the Second and Third Assessment Reports of the Intergovernmental Panel on Climate Change

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_2), 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_2. 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 generally accepted authority on GWPs is the Intergovernmental Panel on Climate Change (IPCC). In 2001, the IPCC updated its estimates of GWPs for key greenhouse gases. The table at the right compares the GWPs published in 1996 in the IPCC's Second Assessment Report[a] and those published in 2001 in the IPCC's Third Assessment Report.[b]

Beginning with the information reported to the Voluntary reporting of Greenhouse Gases Program for 2000, EIA has used the IPCC's revised GWPs to calculate carbon dioxide equivalents in summarizing the results.

Comparison of 100-Year GWP Estimates from the IPCC's Second (1996) and Third (2001) Assessment Reports

Gas	1996 IPCC GWP	2001 IPCC GWP
Methane	21	23
Nitrous Oxide	310	296
HFC-23	11,700	12,000
HFC-125	2,800	3,400
HFC-134a	1,300	1,300
HFC-143a	3,800	4,300
HFC-152a	140	120
HFC-227ea	2,900	3,500
HFC-236fa	6,300	9,400
Perfluoromethane (CF_4)	6,500	5,700
Perfluoroethane (C_2F_6)	9,200	11,900
Sulfur Hexafluoride (SF_6)	23,900	22,200

[a]Intergovernmental Panel on Climate Change, *Climate Change 1995: The Science of Climate Change* (Cambridge, UK: Cambridge University Press, 1996).

[b]Intergovernmental 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 2002
(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	187,842,890	-9,613,898[a]	1,875	—	178,230,867
Methane	3,912,863	76,158,998	—	—	80,071,861
Nitrous Oxide	19,750	-24,463[a]	—	—	-4,713[a]
HFCs	—	—	—	—	0
PFCs	4,453	—	—	3,556,903	3,561,356
SF_6	—	—	—	3,043,682	3,043,682
Total Direct	**191,779,956**	**66,520,637**	**1,875**	**6,600,585**	**264,903,052**
Indirect					
Carbon Dioxide	37,774,410	17,089,762	—	—	54,864,171
Methane	1,454,318	23,101,467	—	—	24,555,786
Nitrous Oxide	39,886	124,328	—	—	164,214
HFCs	—	—	—	47	47
PFCs	36,705	—	—	—	36,705
SF_6	—	—	—	81	81
Total Indirect	**39,305,319**	**40,315,557**	**—**	**127**	**79,621,003**
Sequestration					
Carbon Dioxide	—	—	7,296,514	—	7,296,514
Methane	—	—	—	—	—
Nitrous Oxide	—	—	—	—	—
HFCs	—	—	—	—	—
PFCs	—	—	—	—	—
SF_6	—	—	—	—	—
Total Sequestration	**—**	**—**	**7,296,514**	**0**	**7,296,514**
Unspecified[b]					
Carbon Dioxide	12,788,638	20,962	10,722	—	12,820,322
Methane	11,832	4,283,280	—	—	4,295,112
Nitrous Oxide	—	—	—	—	—
HFCs	—	—	—	—	—
PFCs	30	—	—	130,900	130,930
SF_6	—	—	—	10,201	10,201
Total Unspecified	**12,800,500**	**4,304,242**	**10,722**	**141,101**	**17,256,565**

[a]Negative reductions represent increases in emissions.

[b]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.

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 1994-2002

(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(R)	159,129,312	81,569,042	711,633	—	3,606,813	2,475,144	**247,491,944**
2002	178,230,867	80,071,861	-4,713	—	3,561,356	3,043,682	**264,903,052**
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(R)	48,255,932	23,216,197	154,566	—	34,319	81	**71,661,094**
2002	54,864,171	24,555,786	164,214	47	36,705	81	**79,621,003**
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(R)	7,956,823	—	—	—	—	—	**7,956,823**
2002	7,296,514	—	—	—	—	—	**7,296,514**
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(R)	10,855,046	3,960,348	—	—	4,046	20,261	**14,839,701**
2002	12,820,322	4,295,112	—	—	130,930	10,201	**17,256,565**

(R) = revised.

[a]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.

include reductions and sequestration reported on the short form, increased by 16 percent to 17 million metric tons carbon dioxide equivalent in 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.

Ninety-three percent of the projects reported for 2002 on Form EIA-1605 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 2002 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 2002, 257 million metric tons carbon dioxide equivalent of direct emissions (97 percent of total direct reductions), 78 million metric tons carbon dioxide equivalent of indirect emissions (98 percent of total indirect reductions), and 7 million metric tons carbon dioxide equivalent of sequestration (94 percent of total sequestration reductions) were reported as having been estimated using modified reference cases (Table 7). The only project category for which a significant proportion (87 percent) of the reported direct reductions were estimated using basic reference cases was halogenated substances.

Entity Level

Most of the 114 reporters providing entity-level information included data on emissions as well as emission reductions or sequestration. Six reporters provided

Table 6. Number of Projects Reported on Form EIA-1605 by Reduction Objective, Project Type, and Reference Case Employed, Data Year 2002
(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	**732**	**92**	**61**	**8**	**793**
Electricity Generation, Transmission, and Distribution	392	98	6	2	398
Cogeneration and Waste Heat Recovery	19	95	1	5	20
Energy End Use	266	84	49	16	315
Transportation and Offroad Vehicles	55	92	5	8	60
Reducing Methane and Nitrous Oxide Emissions	**438**	**98**	**7**	**2**	**445**
Waste Treatment and Disposal (Methane)	399	99	4	1	403
Agriculture (Methane and Nitrous Oxide)	3	100	0	0	3
Oil and Natural Gas Systems and Coal Mining (Methane)	36	92	3	8	39
Carbon Sequestration	**392**	**95**	**20**	**5**	**412**
Halogenated Substances	**21**	**50**	**21**	**50**	**42**
Other Emission Reduction Projects	**72**	**88**	**10**	**12**	**82**
Total	**1,655**	**93**	**119**	**7**	**1,774**

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.

entity-level data on emissions only, and another five reporters provided entity-level data on emission reductions or sequestration only.

Total entity-level direct emissions reported for 2002 were 870 million metric tons, which represents a 9-percent increase from the 800 million metric tons reported for 2001 (Table 8). Total entity-level indirect emissions reported for 2002 were less than 1 percent lower than those reported for 2001, at 111 million metric tons carbon dioxide equivalent. Total direct emission reductions reported at the entity level for 2002 were 1.3 percent lower than those reported for 2001—209 million metric tons carbon dioxide equivalent, as compared with 212 million metric tons carbon dioxide equivalent. For 2002, 148 million metric tons carbon dioxide equivalent (71 percent) of the reported direct reductions were estimated using modified reference cases, and 29 percent were estimated with basic reference cases.

Reported entity-level indirect emission reductions for 2002 totaled 36 million metric tons carbon dioxide

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 2002
(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	**185,490,343**	**2,220,921**	**24,285,647**	**149,321**	**0**	**0**
Electricity Generation, Transmission, and Distribution	160,390,367	1,622,551	11,905,462	430	NA	NA
Cogeneration and Waste Heat Recovery	1,098,076	-482	3,327,057	0	NA	NA
Energy End Use	23,975,176	583,610	8,893,438	147,425	NA	NA
Transportation and Offroad Vehicles	26,724	15,242	159,690	1,466	NA	NA
Reducing Methane and Nitrous Oxide Emissions	**66,138,998**	**381,639**	**39,212,250**	**1,103,307**	**NA**	**NA**
Waste Treatment and Disposal (Methane)	47,812,587	372,667	39,173,085	1,103,307	NA	NA
Agriculture (Methane and Nitrous Oxide)	180	0	22,623	0	NA	NA
Oil and Natural Gas Systems and Coal Mining (Methane)	18,326,231	8,972	16,541	0	NA	NA
Carbon Sequestration	**1,875**	**0**	**0**	**0**	**6,827,104**	**469,410**
Halogenated Substances	**855,269**	**5,745,315**	**127**	**0**	**NA**	**NA**
Other Emission Reduction Projects	**4,068,692**	**0**	**14,028,588**	**672,187**	**NA**	**NA**
Total	**256,555,177**	**8,347,875**	**77,526,612**	**1,924,815**	**6,827,104**	**469,410**

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 1994-2002
(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)	114	799.6	111.5	121.4	90.4	211.9	38.9	-6.7	32.2	7.5
2002	114	869.8	111.0	148.2	60.9	209.1	44.2	-7.7	36.4	6.8

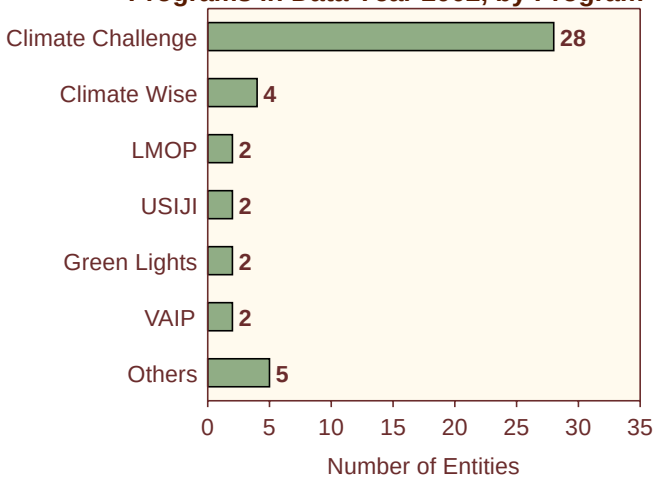
(R) = revised.
Notes: 2001 data year includes late reports that were not received in time to be included in last year's annual report and database. Negative reductions represent increases in emissions.
Source: Energy Information Administration, Form EIA-1605.

equivalent, 13 percent higher than the total reported for 2001. Reported indirect reductions of 44 million metric tons carbon dioxide equivalent calculated with modified reference cases were offset by -8 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 2002 totaled 7 million metric tons carbon dioxide equivalent, 9 percent less than was reported for 2001.

Commitments

Seventy-nine entities reported formal commitments to reduce emissions, take specific action to reduce emissions, or provide financial support for activities related to greenhouse gas reductions.[5] More than one-third (34 percent) of these entities are electricity generators participating in the Climate Challenge Program (Figure 3). Other voluntary programs represented among the commitments reported for 2002 included Climate Wise, the Voluntary Aluminum Industrial Program, the U.S. Initiative on Joint Implementation, the Green Lights Program, the Landfill Methane Outreach Program, Motor Challenge, and the Sulfur Hexafluoride Emissions Reduction Partnership for Electric Power Systems.[6]

Figure 3. Number of Entities Reporting Commitments Associated with Voluntary Programs in Data Year 2002, by Program



Notes: LMOP = Landfill Methane Outreach Program, USIJI = United States Initiative on Joint Implementation, VAIP = Voluntary Aluminum Industry Partnership. Others include Coalbed Methane Outreach Program, Cool Communities Program, Motor Challenge Program, and Sulfur Hexafluoride Emissions Reduction Partnership for Electric Power Systems. 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.

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.

Twenty-four firms made 30 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 2002, companies reported commitments to reduce entity-level emissions by a total of 340 million metric tons carbon dioxide equivalent, including 17 commitments, representing 67 million metric tons carbon dioxide equivalent or 20 percent of the emission reductions promised, that were to be fulfilled by 2002 or earlier. The other 13 entity-level commitments, which promised reductions totaling 273 million metric tons carbon dioxide equivalent, were to be fulfilled by 2003 or later.

Twenty-six companies reported on commitments to undertake 184 individual emission reduction projects. 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 329 million metric tons carbon dioxide equivalent. Twenty-one firms made financial commitments. The total amount of funds promised was $51 million, of which $5 million was reported to have been expended in 2002.

Status of Policy Initiatives

In 2003, 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

[5]Fifty companies reported formal commitments in one or more of the entity-level, project-level, or financial categories accommodated by Form EIA-1605. Thirty-five companies provided descriptions of future activities only in the Additional Information section of Schedule IV.

[6]The Climate Wise and Green Lights voluntary programs were incorporated into the EPA's Energy STAR prgoram in 2001.

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 2002 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

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.

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 2003, DOE continued to collaborate with the Departments of Agriculture and Commerce and the EPA 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 program. That release was followed by a 60-day comment period. DOE also held a public workshop in Washington, DC, on January 12, 2004, to encourage an open exchange of views on issues raised by the proposal.

To supplement the General Guidelines, DOE is also developing Technical Guidelines that specify the methods and factors to be used in measuring and estimating greenhouse gas emissions, emission reductions, and carbon sequestration. DOE expects to release both revised General and Technical Guidelines for combined review in late spring or early summer and plans to issue final revised General and Technical Guidelines to the Voluntary Reporting of Greenhouses Gases Program by the end of 2004, with the expectation that EIA will implement the enhanced program in 2005.

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

Voluntary greenhouse gas emissions reporting programs and other State initiatives, such as emissions targets, emissions inventories and monitoring, and emissions mitigation strategies, continue to gain momentum as the Federal Government develops programs to meet the greenhouse gas emission intensity goals established in the President's Global Climate Change Initiative, and as the States investigate the most cost-effective policies to address climate change. Highlights of Federal, State, regional and other voluntary program activities in 2003 are summarized below.

President's Climate VISION. On February 12, 2003, DOE, on behalf of President Bush, launched the President's "Climate VISION" (Voluntary Innovative Sector Initiatives: Opportunities Now)—a voluntary public-private partnership to pursue cost-effective initiatives to reduce the projected growth in U.S. greenhouse gas emissions. Climate VISION, to be administered by DOE, is intended to help meet the President's greenhouse gas intensity goal. Climate VISION involves Federal

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.

agencies, including DOE, the EPA, and the Departments of Agriculture and Transportation, working with industry partners to reduce greenhouse gas emissions voluntarily over the next decade. 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 forestry products.

Climate Leaders. In February 2002, the EPA established Climate Leaders, a new voluntary industry-government partnership to encourage companies to establish clear greenhouse gas emission reduction targets and develop comprehensive long-term strategies for mitigating climate change. In 2003, the EPA recruited additional partners into the program and continued to develop reporting requirements. The Climate Leaders program has recruited 54 partners, 20 of which have established greenhouse gas reduction goals. By joining Climate Leaders, the partners commit themselves to documenting their emissions of the six major greenhouse gases (carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and SF_6) on a company-wide, facility-level basis (including, at a minimum, all their domestic facilities). Climate Leaders includes a number of reporting options, and the EPA plans to solicit feedback from partners in early 2004 on the type and level of data to be reported under the program.

California. The California Climate Action Registry (CCAR), a voluntary program for reporting and registering greenhouse gas emissions that occur inside or outside the State of California, issued reporting protocols and began enrolling members in October 2002. The CCAR requires third-party verification and seeks to protect participants' reported reductions under possible future regulatory programs. As of November 2003, the CCAR had enrolled more than 40 organizations and companies, with combined annual revenues of more than $140 billion.[7] The CCAR has also developed 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.

Wisconsin. Wisconsin has developed a registry for recording reductions in emissions of greenhouse gases and other pollutants. To date, the registry has received one report involving a reduction in emissions of volatile organic compounds (VOCs).

Northeastern States. The six New England States and the Eastern Canadian Provinces 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, this effort has been spearheaded by 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.[8] NESCAUM has received a grant from The Energy Foundation to develop and implement a regional greenhouse gas registry and is collaborating with California to use CCAR's CARROT software.[9] In July 2003, New York Governor George Pataki announced that he had received commitments from nine northeastern States (the NESCAUM States plus Pennsylvania) to develop a cap-and-trade program to reduce carbon dioxide emissions from power plants.[10]

West Coast States. In September 2003, the governors of Washington, Oregon, and California announced a new 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.[11] The specifics of the registry have not been announced.

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 World Resources Institute (WRI) and the World

[7]Seven of the organizations have at one time or another submitted reports to the Voluntary Reporting Program, including the following reporters for 2002: Los Angeles Department of Water and Power, PG&E Corporation, Sacramento Municipal Utility District, and Southern California Edison.

[8]Conference 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.cmp.ca/images/pdf/eng/2003ReportClimate.pdf.

[9]"Regionally Coordinated Climate Change Policies Gaining Momentum in the Northeast U.S.," in *Issue Spotlight* (U.S. Climate Policy Service, M.J. Bradley Associates, Inc.), web site www.mjbradley.com/uscps.html.

[10]Governor George Pataki, "Governor Announces Cooperation on Clean Air Initiative" (Press Release, July 24, 2003), web site www.state.ny.us/governor/press/year03/july24_03.htm.

[11]"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/Governors%20Statement.pdf.

Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol initiative is not a formal reporting program but 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 is currently under revision. WRI/WBCSD is also developing a project module, which is expected to be released in 2004, and various calculation tools to assist users of the protocol in quantifying their greenhouse gas emissions.[12]

World Economic Forum Global Greenhouse Gas Register. In December 2003, the World Economic Forum 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. Eight major corporations (which, according to the World Economic Forum, represent nearly 5 percent of all global greenhouse gas emissions) have committed to participate in the registry: Anglo American, Cemex, Hewlett-Packard, Lafarge, RAO Unified UESR, RWE, ScottishPower and Vattenfall.[13] The Global Greenhouse Gas Register intends to begin accepting reports in January 2004, using reporting software based on CCAR's CARROT software.[14]

Federal Legislation on Voluntary Greenhouse Gas Reporting

Several bills addressing the reporting of greenhouse gas emissions, emission reductions, and carbon sequestration by individual entities were introduced at the beginning of the 108th Congress, which convened in January 2003. Of the bills that were introduced, only S. 139, the Climate Stewardship Act of 2003, introduced in the U.S. Senate by Senators Joe Lieberman (D-CT) and John McCain (R-AZ), was the subject of a floor vote in either chamber. S. 139 was intended to 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, the system proposed in S. 139 would have required allowances for emissions from entities with emissions exceeding 10,000 metric tons carbon dioxide equivalent, from producers and importers of HFCs, PFCs, and SF_6, and from producers and importers of fossil fuels used for transportation. The objective of the legislation was to reduce emissions by the covered entities to 2000 levels by 2010. The original bill also included a second target that would have required covered entities to reduce emissions to 1990 levels by 2016; however, that provision was removed before the floor vote. The bill also included provisions for voluntary reporting of greenhouse gas emission reductions achieved between 1990 and 2010. Allowance allocation credits would have been awarded to the reporters of emission reductions.[15] On October 30, 2003, the Senate voted by a 55-43 margin to reject S. 139.[16]

Other legislation introduced in the 108th Congress included the following bills:

S. 17, Global Climate Security Act of 2003. Senator Tom Daschle (D-SD) and 15 other Senators introduced S. 17 in January 2003. Title II of the bill, the National Greenhouse Emissions Inventory and Registry Act of 2003, was based on S. 1870, a bill introduced in December 2001 by Senator Jon Corzine (D-NJ) in the 107th Congress.[17] S. 17 included provisions for mandatory reporting of greenhouse gas emissions by entities emitting more than a threshold quantity of greenhouse gas (to be determined by the EPA Administrator). It also included provisions for voluntary reporting of emission reductions and sequestration increases by participating entities, with the EPA establishing and administering a national greenhouse gas registry to collect the information reported.

S. 366, Clean Power Act of 2003. Introduced by Senator Jim Jeffords (I-VT), S. 366 included a goal of reducing emissions of sulfur dioxide, nitrogen oxides, carbon dioxide, and mercury from electric power plants.

[12]World Business Council for Sustainable Development and World Resources Institute, *Greenhouse Gas Protocol Initiative*, Newsletter No. 9 (September 2003).

[13]World Economic Forum, "World Economic Forum Creates Global Greenhouse Gas Register" (Press Release, December 9, 2003), web site www.weforum.org.

[14]California 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.

[15]Energy Information Administration, *Analysis of S.139, the Climate Stewardship Act of 2003*, SR/OIAF/2003-02 (Washington, DC, June 2003), p. 1.

[16]Reuters News Service, "Senate Rejects Bipartisan Plan to Cap Greenhouse Gases" (November 3, 2003).

[17]On January 17, 2003, Senators Corzine, Jeffords, and Lieberman also separately introduced the National Greenhouse Gas Emissions Inventory and Registry Act of 2003 (S. 194), which was almost identical to Title II of S. 17. On March 12, 2003, Representative John Olver (D-MA) and 28 others introduced H.R. 1245, the National Greenhouse Gas Emissions Inventory Act of 2003, in the U.S. House of Representatives. H.R. 1245 was nearly identical to S. 194.

Annual carbon dioxide emissions at plants with a nameplate capacity of 15 megawatts or more would have been capped at 2.05 billion tons[18] beginning in 2009. Generators covered by the legislation would have been allocated emissions allowances for the covered gases and would have been able to trade their unused allowances for emissions of carbon dioxide and the other pollutants, except mercury.

S. 843, Clean Air Planning Act of 2003. Senators Tom Carper (D-DE), Lincoln Chafee (R-RI), and Judd Gregg (R-NH) introduced S. 843 on April 9, 2003. The bill included provisions for market-based programs to reduce emissions of carbon dioxide, sulfur dioxide, nitrogen oxides, and mercury. It would have capped carbon dioxide emissions from covered electric power plants at projected 2006 levels in the years 2009 through 2012 and at 2001 levels in 2013 and subsequent years. A version of S. 843 was introduced in the U.S. House of Representatives as H.R. 3093 by Rep. Charlie Bass (R-NH) on September 16, 2003.

Accounting Issues for Voluntary Reporting and Beyond

The Voluntary Reporting of Greenhouse Gases Program was designed primarily to serve as a mechanism by which entities could report voluntary actions intended to reduce greenhouse gas emissions and sequester carbon.[19] EIA has the responsibility, among other things, for establishing and maintaining a database of reported greenhouse reductions that also serves as a national registry of reported reductions. While the information in the database may be used by the reporting entity to demonstrate achieved reductions of greenhouse gases, the program was not designed to support credit for early reductions or emissions trading programs. The program guidelines did not attempt to resolve the issues that arise in constructing the required reporting rules that would create a set of comparable, verifiable, auditable emission and reduction reports. Such rules would also be required for the flexible mechanisms, such as the Clean Development Mechanism, Activities Implemented Jointly, and Joint Implementation, included in the United Nations Framework Convention on Climate Change and its Kyoto Protocol.

The current Voluntary Reporting of Greenhouse Gases Program allows reporters considerable flexibility in the scope and content of their reports. As a result, companies can report their emissions and reductions in several different ways, and potentially more than one reporter can claim the same reduction. Some commentators on the program have characterized this aspect as a defect: a problem needing a solution. A more restrictive program, however, could limit the number of entities reporting, as well as the types of activities reported. Therefore, because it tends to increase participation in voluntary reporting, flexibility can be viewed as a useful attribute of the program for the following reasons:

- The educational and public recognition aspects of the program are enhanced by maximizing the participation and do not necessarily require a complete and fully-defined system of property rights to a reported emission reduction.
- The Voluntary Reporting Program can be viewed as a survey of emission accounting methods and theories actually in use, and a set of illustrations of the potential accounting and baseline problems that must be confronted in designing future policy instruments. A more structured approach might have been less useful for identifying and analyzing these emissions accounting issues.
- The Voluntary Reporting database illustrates the range and diversity of concrete actions that firms can undertake to limit greenhouse gas emissions, including many not imagined by the designers of the program. A more structured approach might have excluded some of the more original and innovative projects reported to the program.

These features make the program useful in evaluating the design and consequences of any proposed credit for early action program as well as the Kyoto Protocol's flexible mechanisms. By creating a database of real-world emission reduction actions and actors, the data reported to the Voluntary Reporting Program can be used to gain insight into the incentive effects and beneficiaries of various credit for early action and related proposals. The Voluntary Reporting of Greenhouse Gases database has provided a mechanism for identifying some of the issues that would have to be resolved in developing an accounting system for quantifying emissions, emission reductions, and sequestration. Such an accounting system will have to answer the following questions:

- Who can report?
- What is a reduction?
- Who owns the reduction?

[18]Equivalent to 1.86 billion metric tons carbon dioxide. Total carbon dioxide emissions from the electric power sector in 2000 are estimated by EIA at 2.25 million metric tons. See Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2002*, DOE/EIA-0573(2002) (Washington, DC, October 2003), Table 10, p. 30, web site www.eia.doe.gov/oiaf/1605/1605a.html.

[19]This discussion of accounting issues is based on testimony given by 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.

- Would the reduction have happened anyway?
- How does one verify reports?

Who Can Report?

Section 1605(b) of the Energy Policy Act of 1992 mentioned only "entities" and "persons" as prospective reporters. Several overlapping concepts of "who can report" surfaced at the public hearings for the guidelines for the Voluntary Reporting Program, all of which were accommodated. These included:

- **A legal person: i.e., an individual, household, corporation, or trade association.** In this approach, emissions and reductions are calculated and reported for the entire entity.
- **A facility or group of facilities.** Emissions and reductions are calculated as those of a particular facility, defined as a single plant in a specified location, or perhaps even a single stack within a plant. A corporation or legal person acquires responsibility for emissions and reductions through ownership of one or more specified facilities.
- **A "project" or activity.** Reductions are defined by comparing the emissions from some set of sources deemed relevant with an estimate of what emissions would have been if a particular action or bundle of actions had not been undertaken.

What is a Reduction?

Perhaps the most intuitive definition of a reduction is one measured against an historical baseline, which represents the use of a "basic reference case." In this approach, the reduction is defined as the difference between the emissions of an entity or facility in a prior, baseline year, usually 1990, and in the current year. This approach is best suited to reporters whose activities have not appreciably changed since the baseline year. It presents particular problems for firms that have participated in mergers, acquisitions, or divestitures, or have made significant changes in the composition of their business. Startup companies or new facilities that have no history cannot use historical baselines. The historical baseline approach is also not well suited to measuring the reductions achieved by projects, because projects are often entirely new activities with no history.

Alternatively, many reporters define their reductions by comparison with what would have happened in the absence of a specified set of actions. Thus, corporate emissions may have risen, but they are less than they would have been in the absence of corporate action. This approach is called, in the Voluntary Reporting Program, a "modified reference case" or a "hypothetical baseline." It is important to point out, however, that a hypothetical baseline is a best guess of what would have happened in the absence of a project, and there is no way *per se* to prove or disprove it. Most of the projects reported to the Voluntary Reporting Program use a hypothetical baseline to calculate emission reductions or sequestration.

The "unit of production" approach is a variant of the fixed historical baseline, where the reporter normalizes baseline emissions to reflect changes in production. If emissions per unit of output have declined, by comparison either with levels in a prior year or with what they would have been in the absence of some actions, then the reporter has a reduction. This approach works reasonably well for organizations that have a well-defined product that is homogeneous across companies and over time: for example, kilowatthours generated or sold, tons of steel, or barrels of crude oil. As products increase in complexity, this approach gradually breaks down. Tons of semiconductors, for example, is a meaningless measure of output.

The alternative measures of reductions have their advantages and disadvantages. Basic reference cases are objective and relatively easily verifiable. On the other hand, absolute reductions are often the product of circumstance rather than action, while modified reference cases (which are more difficult to verify) explicitly measure the results of actions. Unit-of-production reference cases are useful only in a limited number of cases, and they can combine some of the disadvantages of both basic and modified reference cases.

Who Owns the Reduction?

Two theories of emissions ownership coexist in the Voluntary Reporting Program. The most intuitive, and commonplace, is called "direct emissions" and "direct reductions." If a reporter owns or uses (e.g., leases) the emission source, that reporter owns the emission as well as any reductions from this source. The advantage of limiting ownership to direct emissions is that it generally prevents multiple ownership of the same emission or reduction. However, this approach excludes many important emission reduction methods, including all activities that tend to reduce electricity consumption, the activities of energy service companies, and the provision of energy-efficient or emission reducing capital goods.

The alternative theory of ownership is based on causation: if an organization causes an emission or reduction, it is responsible for that emission, even if it does not own the emission source. Emissions or reductions from sources not owned by the reporter are referred to as "indirect." The most important example of indirect emissions is those produced through the consumption of electricity. If entities reduce their consumption of

electricity, they cause their electric utility to reduce its emissions. This approach permits reporting of any action that has an influence on national emissions. However, the concept of "causing an emission" is inherently more ambiguous than "owning the smoke stack," and in many cases more than one firm may credibly claim to have helped cause an emission reduction.

EIA requires that reporters using Form EIA-1605 explicitly identify all emissions and reductions as either direct or indirect so that potentially double-counted reductions can be identified.

Would the Reduction Have Happened Anyway?

This issue is often discussed in other contexts under the term "additionality." It has been suggested that many emission reduction projects do not represent "real" reductions, because they would have been undertaken "anyway" in the normal course of business; however, creating an operational definition of additionality is difficult, because the "normal course of business" is a hypothetical concept. For the purposes of voluntary reporting—which include publicizing the types of actions that limit national greenhouse gas emissions and providing recognition for the companies that undertake those actions voluntarily—determining the additionality of projects is unnecessary. For the purposes of a credit for early reduction program, however, additionality is an issue that needs to be considered.

How Does One Verify Reports?

The Department of Energy decided not to require verification by an independent third party after considering this issue during the development of the guidelines for the Voluntary Reporting Program. However, reporters must certify the accuracy of their 1605(b) reports. Also, filing a false statement on a U.S. Government form is illegal. EIA reviews each report received for comprehensiveness, arithmetic accuracy, internal consistency, and plausibility and makes suggestions for improving the accuracy and clarity of reports; however, the reporter is ultimately responsible for the accuracy of any report submitted to the Voluntary Reporting Program.

In general, reports submitted to EIA are factually accurate. Meaningful verification of the accuracy of 1605(b) reporting would require putting in place common baselines and accounting standards that dictate what information should be included in 1605(b) reports and how estimates of greenhouse gas emissions and reductions and carbon sequestration should be calculated. For example, if the accounting treatment for indirect emissions from electricity purchases is undefined, then a particular set of facts about a reporter could result in two different estimates of emissions: one including electricity purchases and one excluding electricity purchases. A third-party verifier can verify the facts about the reporter but cannot determine whether or not indirect emissions from electricity purchases ought to be included and, consequently, cannot determine whether the total emissions reported are correct or not.