

7. Entity-Level Reporting and Future Commitments

Overview

The Voluntary Reporting Program permits three distinct types of emissions reporting:

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

Chapters 2 through 6 of this report are concerned with project-level emissions. This chapter is concerned with entity-level emissions and commitments to reduce emissions in the future. Entity reporting and project reporting are not mutually exclusive. They correspond to different views of the appropriate answer to the question, “What is a reduction?” Most reporters (145) reported project-level reductions, and 56 reported entity-level emissions and reductions. As these numbers imply, most (43) of the firms that reported entity-level emissions also reported project-level emissions. Only 13 firms reported entity-level emissions only, whereas 100 firms submitted only project-level reports. Thus, among entity-level reporters, the norm was to report both kinds of reductions. In some cases, the reduction in emissions reported at the entity level equaled the sum of reductions reported at the project level; however, there were many instances in which the two estimates of reductions differed.

Entity-level emission reductions show outcomes, including the emissions consequences of weather, growing sales of the entity’s products, and other external factors: project-level emission reductions generally indicate the emissions consequences of a particular set of actions. Thus, entity- and project-level reporting are alternative accounting frameworks for measuring emissions and reductions, which will produce identical estimates of emission reductions only if the reporter specifically defines entity-level reductions as the sum of project-level reductions.

Total 1997 greenhouse gas emissions reported to the program at the entity level were about 1.4 billion metric tons carbon dioxide equivalent, or about 23 percent of

total U.S. emissions of greenhouse gases. About 98 percent of reported emissions—weighted by global warming potential (GWP)—were carbon dioxide. Aggregate reported emissions among entity-level participants in the program have risen by about 15 percent since 1990, in part as a result of increases in emissions by individual reporters but also in part because of increasing participation in the program.

The single largest category of reported emissions was 918 million metric tons of carbon dioxide emitted (directly) by stationary combustion sources, mostly electric utilities. The second largest category was the report by General Motors (GM) of 359 million metric tons of indirect carbon dioxide emissions on behalf of the entire U.S. fleet of GM-built vehicles, which accounted for about 24 percent of the emissions reported for 1997.

Reported reductions were, in general, much smaller than reported emissions. Reported entity-level reductions totaled 121 million metric tons of carbon dioxide in 1997, or about 8 percent of reported emissions.

Entity-Level Reporting

Who Reported

Electric utilities accounted for 40 of the 56 entity-level reporters. They included Southern Company, the Tennessee Valley Authority (TVA), and most of the other largest electric utilities in the United States. Three subsidiaries of the AES Corporation (an independent power producer) reported on domestic power plants with emissions offset by international forestry projects. The 13 other entity reporters included aluminum smelters (Alcan and VANALCO), a chemical company (Dow), two semiconductor manufacturers (Lucent and Motorola Austin), several large manufacturers (GM, IBM, Johnson & Johnson), a coal producer (Peabody Holdings), an oil company (BP America), a trade association (the Integrated Waste Services Association), and one household.

Most of the entity-level reporters were participants in U.S. Government-sponsored voluntary programs. All the utilities were participants in Climate Challenge, the manufacturers were participants in Climate Wise, the smelters in the Voluntary Aluminum Industrial Program, and the coal company in the Coalbed Methane Outreach Program.

Seven companies (five utilities and two aluminum smelters) reported emissions but not reductions at the entity level. Six of them reported reductions at the project level. A single company (AmerenCIPS, formerly Central Illinois Public Service) reported only emissions. In its report, AmerenCIPS indicated that it plans to report on emission reduction projects in the future.

Reported Emissions

The 56 entity-level reporters claimed some 921 million metric tons of direct carbon dioxide emissions and 500 million tons of indirect carbon dioxide emissions in 1997 (Table 17). Total reported emissions in both categories have been rising since 1990.

The distinction between “direct” and “indirect” emissions corresponds to differing definitions of “ownership” of emissions. A “direct” emission is defined in the Voluntary Reporting Program as an emission from a stack or exhaust pipe owned by the reporter, arising from the combustion of fuel owned by the reporter. An “indirect” emission is an emission from a stack not owned by the reporter, but which has been caused by the reporter. Among entity-wide reporters, the most important examples of indirect emissions were emissions from motor vehicles built by GM and emissions arising from the purchase or sale of electric power.

Reported direct emissions were moderately concentrated. The largest direct emissions reported were from the Southern Company, with emissions of about 100 million metric tons of carbon dioxide. The second largest emitter was TVA, with emissions of about 80 million metric tons of carbon dioxide, followed by PacifiCorp, with emissions of 54 million metric tons of carbon dioxide in 1997.

As noted above, GM claimed indirect emissions of 359 million metric tons of carbon dioxide from the operation of GM-built vehicles in the United States during 1997. Emissions from GM-built vehicles declined during the 1990s, due to both the rising fuel efficiency of the GM-built vehicle fleet and the shrinking size of the fleet. Although emissions did decline over time, GM elected not to claim a corporate reduction in indirect emissions under the Voluntary Reporting Program.

Another form of indirect emissions in the Voluntary Reporting Program is the emissions arising from the purchase or sale of electricity. Manufacturers that purchase electricity usually view themselves as responsible for the electricity they consume and, consequently, for any reductions in the quantity of electricity consumed. Utilities, however, have adopted more diverse views.

Most electric utilities view themselves as responsible only for the direct emissions from their stacks. This view is unambiguous, relatively easy to verify, and prevents the same emission from being reported by more than one utility; however, accounting for reductions in emissions caused by substitutions of purchased power for company-generated power adds complexity to the picture.

Some utilities (for example, Niagara Mohawk, Northeast Utilities, and Long Island Lighting Company) view themselves as responsible for their direct emissions plus the indirect emissions from electricity purchases necessary to support their customer base. This approach accounts for the possibility that a decline in generation may be associated with an increase in power purchases, but it may create the appearance of an increase in emissions when a firm is both buying and selling (i.e., trading) increasing volumes of wholesale electricity. Also,

Table 17. Total Reported Entity-Level Carbon Dioxide Emissions by Type of Activity, Data Years 1990-1997
(Million Metric Tons Carbon Dioxide)

Type of Reduction	1990	1991	1992	1993	1994	1995	1996	1997
Direct Emissions								
Stationary Combustion	795.2	648.6	741.7	778.8	810.8	859.0	876.9	918.5
Transportation	2.5	0.1	0.1	0.1	0.6	1.8	1.8	2.0
Other Direct Sources	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6
Total Direct	797.9	648.9	742.0	779.1	811.6	861	878.9	921.1
Indirect Emissions								
Purchased Power	72.6	65.8	64.4	71.2	71.8	75.5	83.3	141.9
Other Indirect Emissions	380.2	371.2	375.3	376.5	378.0	372.5	365.8	358.7
Total Indirect	452.8	437.0	439.7	447.7	449.8	448.0	449.1	500.6
Total Reported	1,250.7	1,085.9	1,181.7	1,226.8	1,261.4	1,309.0	1,328.0	1,421.7
(Memo) Electricity Wholesaling	35.0	31.4	31.8	33.1	32.1	34.1	35.9	63.7

Source: Energy Information Administration, Form EIA-1605.

double reporting is possible, because both the buyer and seller of the electricity may claim ownership.

A few utilities (for example, Central Hudson and DTE Energy) have taken a “net” view, in which they see themselves as being responsible for direct generation emissions plus indirect electricity purchase emissions, minus emissions from “wholesale” electricity sales to other utilities. This approach captures net emissions to supply an end-use customer base, but there is greater potential for double counting, because double reporting is possible for both buying and selling. Further, “generation only” electricity producers, such as independent power producers or generation and transmission cooperatives, would be in the position of defining essentially all their direct emissions as belonging to their customers.

Any organization that reports indirect emissions and reductions is presented with a methodological problem: because the reporter does not control the source of emissions, the reporter may not have sufficient information to estimate emissions accurately. Most reporters, however, reported only direct emissions. For those who reported indirect emissions, with a few exceptions, the impact of indirect emissions was generally small in comparison with the magnitude of direct emissions.

Emissions of other greenhouse gases reported at the entity level were much smaller than the reported emissions of carbon dioxide and represented proportionately smaller shares of U.S. emissions (Table 18). Emissions of other gases tended to be concentrated, with only a few companies reporting emissions.

Only five companies reported entity-level methane emissions, and only three reported nitrous oxide emissions. Almost all the reported emissions of both gases were attributable to GM’s reported indirect emissions from GM-built vehicles. The rapid rise in reported hydrofluorocarbon emissions also resulted from GM’s

increasing use of HFC-134a as a replacement air conditioning refrigerant in automotive air conditioners. Only one company (Alcan Ingot) reported PFC emissions at the entity level. Two companies (NIPSCO and Dow) reported sulfur hexafluoride emissions.⁶⁶

Reported Reductions

The 49 companies that reported entity-level emission reductions in the 1997 reporting cycle reported reductions totaling 127 million tons carbon dioxide equivalent (Table 19), equal to about 2 percent of total U.S. greenhouse gas emissions. The largest single reported 1997 reduction was that of TVA, at 24 million metric tons carbon dioxide equivalent, followed by the Integrated Waste Services Association, reporting on behalf of the entire “waste-to-energy” industry at 21 million tons, and Florida Power & Light at 20 million tons. The next largest reporter, Entergy Services, reported reductions of 5.5 million tons carbon dioxide equivalent. Thus, three reporters accounted for slightly more than half the reductions claimed for 1997.

Most of the emission reductions reported were attributable to energy-related carbon dioxide, although the Integrated Waste Services Association reported that its combustion of municipal solid waste reduced emissions of methane by 3 million metric tons carbon dioxide equivalent, and the New England Electric System reported methane emission reductions, mostly from landfill gas capture operations, of 0.8 million metric tons carbon dioxide equivalent.

The largest reported reductions were computed on the basis of “modified” reference cases—i.e., the reporter indicated that emissions were lower than they would have been without the actions taken by the reporter. TVA, for example, used a generation planning model to calculate what its emissions during the 1990s would have been if they had used the set of generating units

Table 18. Total Reported Entity-Level Emissions of Other Greenhouse Gases by Type of Gas, Data Years 1990-1997
(Million Metric Tons Carbon Dioxide Equivalent)

Gas	1990	1991	1992	1993	1994	1995	1996	1997
Methane	1.5	1.5	1.6	1.5	1.6	1.5	1.5	1.4
Nitrous Oxide	15.9	16.6	17.4	18.0	18.8	18.5	17.8	17.0
Hydrofluorocarbons	*	*	*	0.2	0.8	1.3	1.8	2.3
Perfluorocarbons	1.7	1.5	1.4	1.4	1.0	0.8	0.7	0.7
Sulfur Hexafluoride	NR	0.1	0.1	0.1	1.1	1.4	1.4	1.0
Total Emissions	19.1	19.6	20.4	21.1	22.2	22.1	21.8	21.4

*Less than 0.05 million metric tons.

NR = no emissions reported.

Source: Energy Information Administration, Form EIA-1605.

⁶⁶Several other companies reported sulfur hexafluoride emissions at the project level.

operational in 1990 at their 1990 capacity factors and heat rates. Since 1990, TVA has greatly expanded nuclear generation. Browns Ferry Unit 2 was returned to service in 1991, Browns Ferry Unit 3 returned to service in 1995, and Watts Bar Unit 1 started commercial operation in 1996. TVA's 1997 carbon dioxide emissions were several million metric tons below 1990 levels and 24 million metric tons below what they would have been if TVA's 1990 generation mix and heat rates had been used.

Florida Power & Light also calculated its reductions on the basis of a modified reference case. The company, which did not report on a project basis, indicated that its reductions were based on nuclear availability improvements, fuel switching to natural gas, heat rate improvements at existing plants, demand-side management programs, and carbon sequestration.

The Integrated Waste Services Association claimed two sources for its reductions: (1) by burning municipal solid waste to generate electricity, its members made it possible for other utilities to burn less coal; and (2) if the municipal solid waste had not been burned, it could reasonably have been expected to be landfilled, and some portion of the landfilled waste would have decomposed anaerobically, producing methane emissions. Thus, the Association reported that burning the waste reduced fossil fuel burning and methane emissions on the part of others.

Eleven companies (ten electric utilities and the Peabody Holding Company) reported emission reductions at the entity level using a "basic reference case." A basic reference case is defined as total emissions in some baseline year—usually, but not always, 1990. Nine firms used 1990 as a baseline year; two firms (Northeast Utilities and Long Island Lighting Company) used their average 1987-1990 emissions as a baseline. In these cases, reductions were calculated as the difference between actual emissions and emissions in the baseline year.

Six of the eight electric utilities reporting declining emissions between 1990 and 1997 separately reported rising sales to end users between 1990 and 1996 or 1997. In the two cases where sales did decline (Niagara Mohawk and Central Hudson), sales declined much more slowly than emissions.

The results obtained by companies reporting basic reference cases may have been influenced by their treatment of indirect emissions from electric power purchases and sales (Figure 17). Three companies that did not report indirect emissions (Arizona Public Service Company, Potomac Electric Power Company, and Public Service Electric & Gas) had rising electricity sales to end users and declining emissions, suggesting that they may have been able to meet growing customer demand in part by purchasing, rather than generating, electricity.

Table 19. Total Reported Entity-Level Carbon Dioxide Emission Reductions by Type of Activity, Data Years 1991-1997
(Million Metric Tons Carbon Dioxide)

Type of Reduction	1991	1992	1993	1994	1995	1996	1997
Direct Reductions							
Stationary Combustion	28.4	46.7	54.0	66.5	84.2	95.4	89.8
Transportation	*	*	*	0.1	0.1	0.1	*
Other Direct Sources	NR	*	*	*	*	*	*
Total Direct	28.4	46.7	54	66.6	84.3	95.5	89.8
Indirect Reductions							
Purchased Power	4.9	3.8	6.5	3.3	5.3	4.5	2.7
Other Indirect Sources							
IWSA	NR	NR	NR	NR	17.5	18.4	18.1
All Other Reporters	0.3	0.1	-0.2	1.7	2.9	3.7	2.2
Total Indirect	5.2	3.9	6.3	5.0	25.7	26.6	23.0
Carbon Sequestered	2.0	3.5	7.7	7.7	8.0	8.2	6.9
Total Reported Reductions	34.9	54.0	68.1	77.0	118.0	130.3	121.1
(Memo) Electricity Wholesaling	5.5	7.2	6.7	8.1	6.4	6.6	5.6

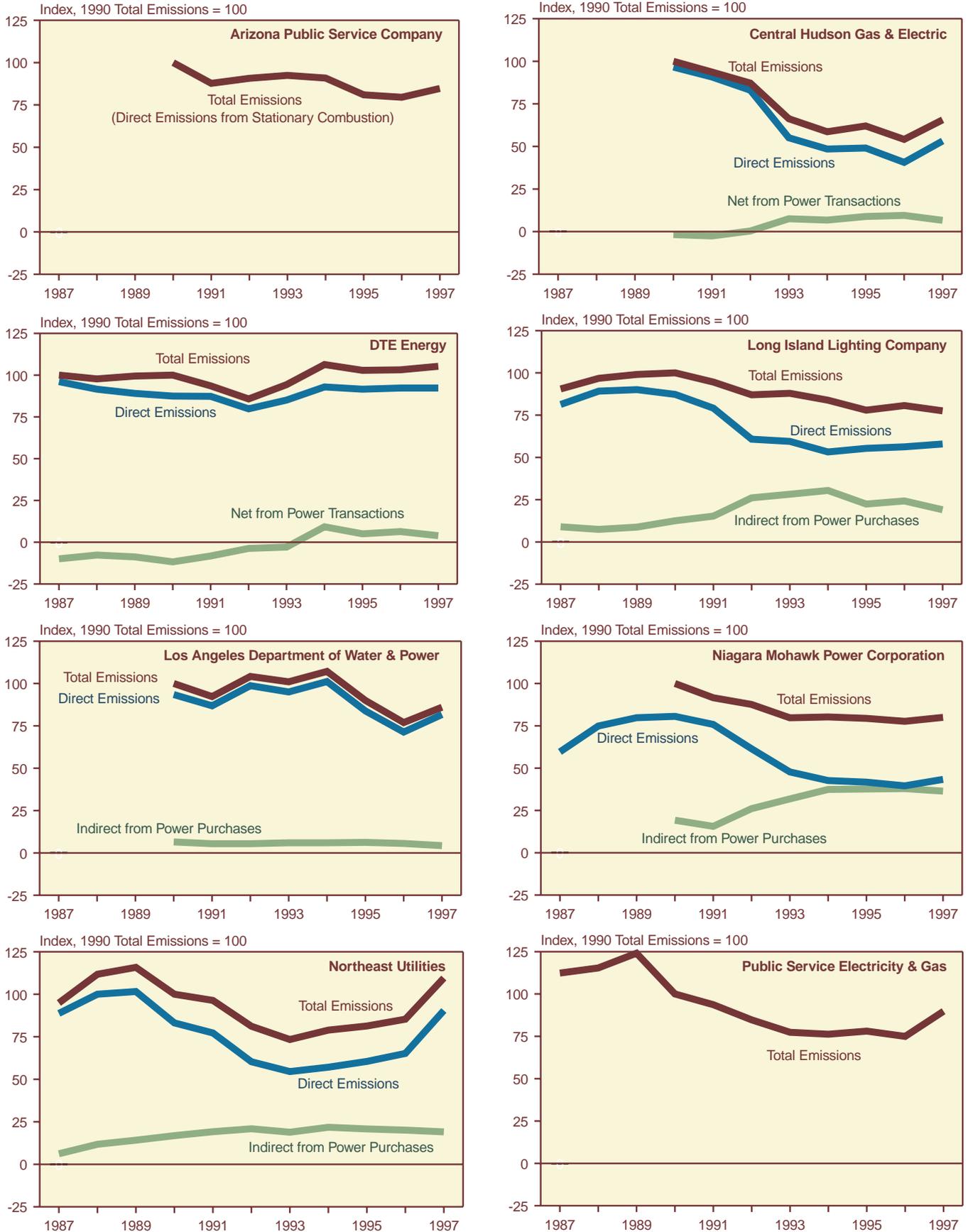
* = less than 0.05 million metric tons of carbon dioxide.

NR = not reported.

Note: "Total Reported" does not add to the sum of reported components because some reporters did not disaggregate their emission reduction categories, and because of differences in the accounting treatment of purchased power by various reporters.

Source: Energy Information Administration, Form EIA-1605.

Figure 17. Entity-Level Emissions of Selected Reporters Using a Basic Reference Case, 1987-1997



Source: Energy Information Administration, Form EIA-1605.

Future Commitments To Reduce Emissions

The Voluntary Reporting Program also permits entities to report commitments to reduce emissions or to take action to reduce emissions in the future. In previous years, virtually all companies reporting future commitments were electric utility participants in the Climate Challenge voluntary program. However, 9 of the 65 future commitment reporters in 1997 were not utilities: Dow, BP America, Noranda, Alcan, Lucent, IBM, Motorola Austin, CLE Resources, and VANALCO. All nine were participants in other voluntary programs, such as Climate Wise for manufacturers and the Voluntary Aluminum Industrial Program.

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 future emissions. A financial commitment has no emissions reporting counterpart: it is a commitment to spend a particular sum of money on emission reduction activities, without a specific promise on the emissions consequences of the expenditure. Most firms reported more than a single commitment, and many reported more than one type of commitment.

Entity commitments are usually to make emissions lower than some level in a target year. Project commitments are usually to reduce emissions by a particular amount over a period of years. Because project commitments can cover a range of years, they are sometimes difficult to compare directly with project-level data for a single year of "achieved reductions."

Entity Commitments

Twenty-nine firms made entity commitments. They made 40 specific promises to reduce, avoid, or sequester future emissions at the corporate level. As in the case of entity reporting, some 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 by comparison with a baseline emissions growth trend.

The entity future commitments often (but not always) mirror reported entity-level emission reductions. Niagara Mohawk, Public Service Electric & Gas, New England Electric System, Cedar Falls Utilities, and Waverley Light & Power committed to reduce emissions to or below baseline levels by 2000. The commitments made

by Niagara Mohawk, Public Service Electric & Gas, and New England Electric System matched their reporting, but both Cedar Falls and Waverley have reported reductions to date using a modified reference case.

In their reports for 1997, companies committed to reducing emissions by 99.6 million metric tons of carbon dioxide. Most companies committed to making their reductions by the year 2000—92.3 million metric tons of reductions, with about two-thirds of that amount from the TVA (22.6 million metric tons), the Los Angeles Department of Water and Power (16 million metric tons), Niagara Mohawk Power (15 million metric tons), and Florida Power & Light (10 million metric tons). TVA and Florida Power & Light measured their commitments using modified reference cases. Niagara Mohawk and the Los Angeles Department of Water and Power used basic reference cases. A few companies specified time horizons other than 2000: Wisconsin Electric committed to reducing emissions by 5 million metric tons carbon dioxide equivalent by 1999, and Dow Chemical committed to reducing emissions of a range of gases by 0.9 million metric tons by 2005.

Project Commitments

Forty-two companies reported on commitments to undertake some 265 individual emission reductions projects. Some of the commitments were linked to future 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 by 92 million metric tons carbon dioxide equivalent, most of which (84 million metric tons) would be carbon dioxide emissions. The two largest individual project commitments (at 17 million metric tons of carbon dioxide each) were made by Texas Utilities and TVA. The TVA project was described as "an increase in low emitting capacity," almost certainly a result of TVA's nuclear program. The Texas Utilities commitment was described as "availability improvement" linked to the performance of its Comanche Peak nuclear plant.

Financial Commitments

Thirty-one firms, all electric utilities, made financial commitments. The total amount of funds promised was \$43 million, of which \$13 million was reported actually to have been expended in 1997. The largest single financial commitment was made by South Carolina Electric & Gas, which committed to spend \$12 million on a "carbon burnout plant" to make fly ash suitable for sale to cement companies. South Carolina Electricity & Gas reported that it actually spent \$15 million in 1997, exceeding its commitment.