

GAO

Report to the Ranking Minority Member,  
Committee on Government Reform and  
Oversight, House of Representatives

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November 1998

# CLIMATE CHANGE

## Basic Issues in Considering a Credit for Early Action Program



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**Resources, Community, and  
Economic Development Division**

B-281309

November 27, 1998

The Honorable Henry A. Waxman  
Ranking Minority Member  
Committee on Government Reform and Oversight  
House of Representatives

Dear Mr. Waxman:

Over the past several years, the level of attention paid to reducing greenhouse gas emissions has increased because these heat-trapping gases are believed to be contributing to global warming. A number of related events, including the President's Climate Change Proposal of October 1997 and the United Nations' Framework Convention on Climate Change in Kyoto, Japan, in December 1997, also focused more attention on how greenhouse gas emissions could be reduced. One part of the President's proposal was a program to reward organizations, by providing credits or incentives, for taking early actions to reduce greenhouse gases before the international agreements from the Kyoto Protocol would take effect.<sup>1</sup> The proposal is now commonly referred to as a "credit for early action" program.

As we previously reported to you in March of this year, efforts to report reductions of greenhouse gas emissions were initiated with the establishment of the Voluntary Reporting Program, as directed by the Energy Policy Act of 1992.<sup>2</sup> Under this program, organizations could voluntarily submit information on their efforts to reduce greenhouse gas emissions to the Department of Energy (DOE) and have that information entered into a public database. DOE specifically designed the program to encourage voluntary participation by offering potential participants flexibility in what they reported and how they estimated their emissions reductions.

In view of the wide range of emissions reduction claims reported by organizations to the program, you expressed interest in efforts to consider granting credit to these organizations for the early actions they have taken. Specifically, you asked the following two questions: (1) What are some of the basic issues that will have to be addressed by any effort to develop a

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<sup>1</sup>To reward early action taken to reduce greenhouse gases, various types of credits or incentives, such as a credit against a company's emissions or a tax credit, could be used.

<sup>2</sup>Department of Energy: Voluntary Reporting Program for Greenhouse Gas Emissions Reductions (GAO/RCED-98-107R, Mar. 24, 1998).

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credit for early action program? (2) How might claims for reductions of greenhouse gas emissions that are reported to the Voluntary Reporting Program fare under a credit for early action program that has less flexible reporting criteria? As agreed with your office, we also present other issues we identified about a credit for early action program that may need to be addressed before the program can be finalized (see app. II).

To select the basic issues associated with developing a credit for early action program, we identified organizations that have been involved with the development of such a program and who have prepared informational papers on their views. We reviewed these documents and interviewed available representatives from these groups.

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## Results in Brief

We identified four basic issues, stated here as questions, that will have to be addressed to develop a credit for early action program to reduce greenhouse gas emissions: (1) How should emissions reductions be estimated? (2) How should emissions reduction ownership be determined? (3) Should the emissions reduction claims be reported at the organization, project, or some other level? and (4) How should emissions reduction claims be verified? On the surface, these issues appear straightforward; in fact, they are complicated and will require difficult choices. Furthermore, the resolution of these issues will likely influence the design of a credit for early action program. The amount of flexibility such a program would provide on each of these issues would ultimately help to determine the extent of participation and the credit awarded.

Many of the claims for reducing greenhouse gas emissions that have been submitted to the Voluntary Reporting Program would probably be ineligible for credit under a new program having more restrictive reporting criteria. This is because the voluntary program was designed to encourage wide participation by allowing companies to submit emissions reduction claims under flexible reporting criteria and was not designed to automatically provide credit to participants for emissions reductions. For example, the voluntary program, among other things, allowed companies discretion in determining the basis from which their emissions reductions were estimated and allowed companies to self-certify that their claims were accurate. According to the Department of Energy's Energy Information Administration and other organizations, such as the Edison

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Electric Institute and the Environmental Defense Fund,<sup>3,4</sup> a credit for early action program could require more restrictive reporting criteria than the Voluntary Reporting Program to help ensure that emissions reduction claims are real, appropriately reviewed, and verified.

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## Background

In 1992, the Energy Policy Act (P.L. 102-486) directed DOE to develop a voluntary reporting program to collect information on activities to reduce greenhouse gas emissions. The act required DOE to (1) develop and issue program guidelines, (2) develop forms for reporting emissions reduction activities, and (3) establish a publicly available database of this information. The program, by design, was to encourage voluntary participation and offer organizations reporting their emissions flexibility in what they reported and how they estimated their emissions reductions. Claims submitted to the program are reviewed by program managers for arithmetic accuracy and for the clarity of the information presented; however, there is no verification of supporting documentation or determination that the emissions reductions actually occurred. The program, however, requires that the persons reporting the information certify its accuracy.

For the first two reporting periods (i.e., 1994 and 1995), the program received a total of 250 reports that provided information on 1,612 greenhouse gas emissions projects. For these periods, claims for reducing greenhouse gas emissions reported to the program totaled approximately 257 million tons of carbon dioxide equivalents.<sup>5</sup>

On October 22, 1997, President Clinton announced a three-phased Climate Change Proposal that challenged key U.S. industries to plan how they can best reduce greenhouse gas emissions. Among other initiatives was a proposal to reward organizations that would take early action to reduce their greenhouse gas emissions before any international agreements would take effect. This effort's goal was to make any future required emissions reduction targets easier to achieve.

In early December 1997, the United States and other nations met in Kyoto, Japan, and agreed to reduce their greenhouse gas emissions and set

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<sup>3</sup>The Edison Electric Institute is an association of U.S. investor-owned utilities and industry affiliates established to foster the exchange of ideas and experiences on issues of mutual interest.

<sup>4</sup>The Environmental Defense Fund is a nonprofit organization focused on the development of innovative and economically viable solutions to today's environmental problems.

<sup>5</sup>Carbon dioxide equivalents is a measurement used to compare the global warming impact of carbon dioxide with other greenhouse gases.

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specific targets to achieve during an initial period for monitoring emissions reductions between 2008 and 2012.<sup>6</sup> Specific targets varied among nations, and the United States agreed to reach a target of 7 percent below its 1990 level of emissions.

A White House Task Force on Climate Change was established to address a broad array of issues relating to climate change, such as the task of working on a credit for emissions reductions through an early action program. In May 1998, preliminary information on the credit for early action indicated that the Task Force was considering several options for that program. As of October, the Task Force was continuing to receive input from industry and environmental groups on the issue.

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## Some Basic Issues in Developing a Credit for Early Action Program

Efforts to develop a credit for early action program to reduce greenhouse gas emissions involve consideration of many issues before such a program could be implemented. We identified four issues, stated here as questions, that will have to be addressed in developing a credit for early action program. (1) How should emissions reductions be estimated? (2) How should emissions reduction ownership be determined? (3) Should the emissions reduction claims be reported at the organization, project, or some other level? and (4) How should emissions reduction claims be verified? While these issues appear straightforward, in fact, they are complicated and will require difficult choices. Various views and opinions have been offered on these issues by a variety of groups, including business, industry, public interest, and environmental groups involved in the issues of climate change and greenhouse gas reporting.

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## How Should Emissions Reductions Be Estimated

Determining what qualifies as a creditable reduction of greenhouse gas emissions would likely be one of the first and primary questions in developing a credit for reductions through an early action program. Resolving this question would lay the foundation for the program and strongly influence how many other issues would be addressed.

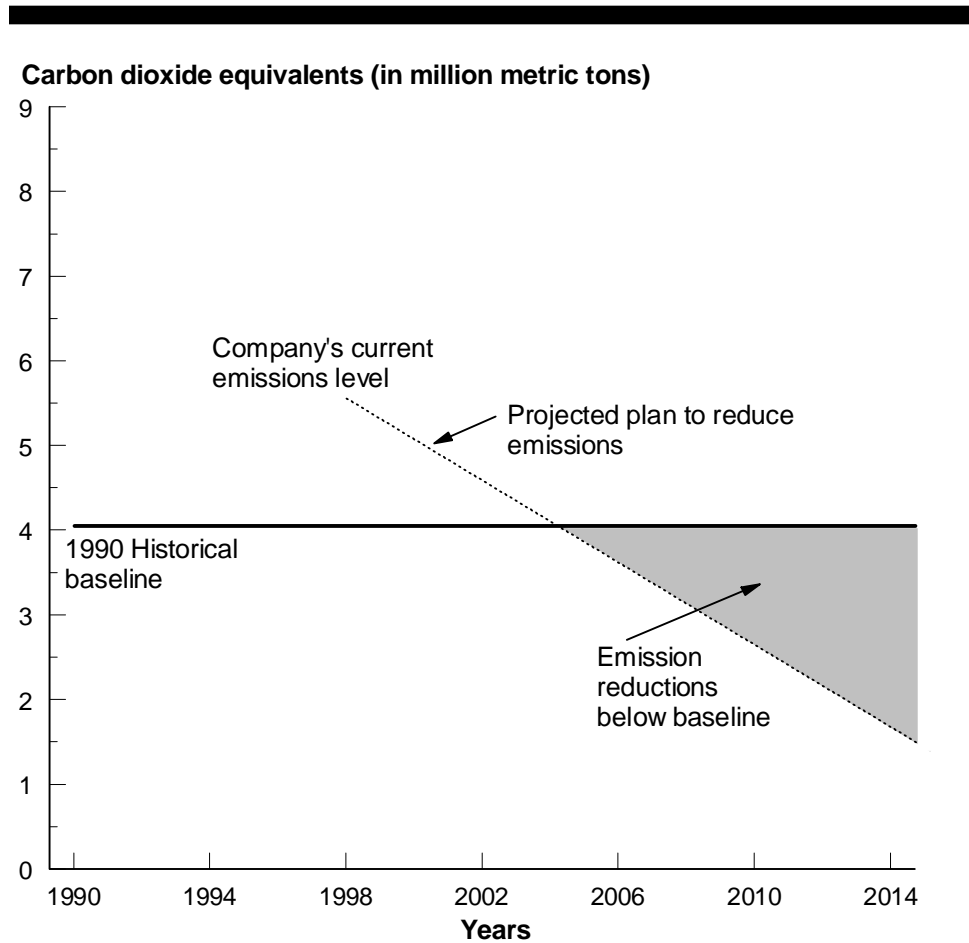
Estimating a creditable emissions reduction involves establishing a baseline, or point from which emissions reductions will be measured. Several approaches have been proposed, including a “historical baseline” of emissions for a given period, such as 1990, that is developed from an organization’s historical data on emissions. As shown in figure 1, a

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<sup>6</sup>This agreement has become known as the “Kyoto Protocol.” GAO testified on the administration’s efforts regarding the protocol. *Global Warming: Administration’s Proposal in Support of the Kyoto Protocol* (GAO/RCED-98-219, June 4, 1998).

company's current level of emissions may be above its 1990 historical baseline.

**Figure 1: Use of a Historical Baseline to Estimate a Company's Carbon Dioxide Equivalent Emissions and Possible Reductions**



Under a historical baseline approach, an organization takes actions to get its total emissions at or below the baseline, for example, in 1990. Once a company's emissions fall below its historical baseline (represented by the shaded area in fig. 1), the company would be eligible for credit. DOE's Energy Information Administration and such groups as the Edison Electric Institute have indicated that growing companies may have more difficulty reducing their emissions because their businesses and consequently their

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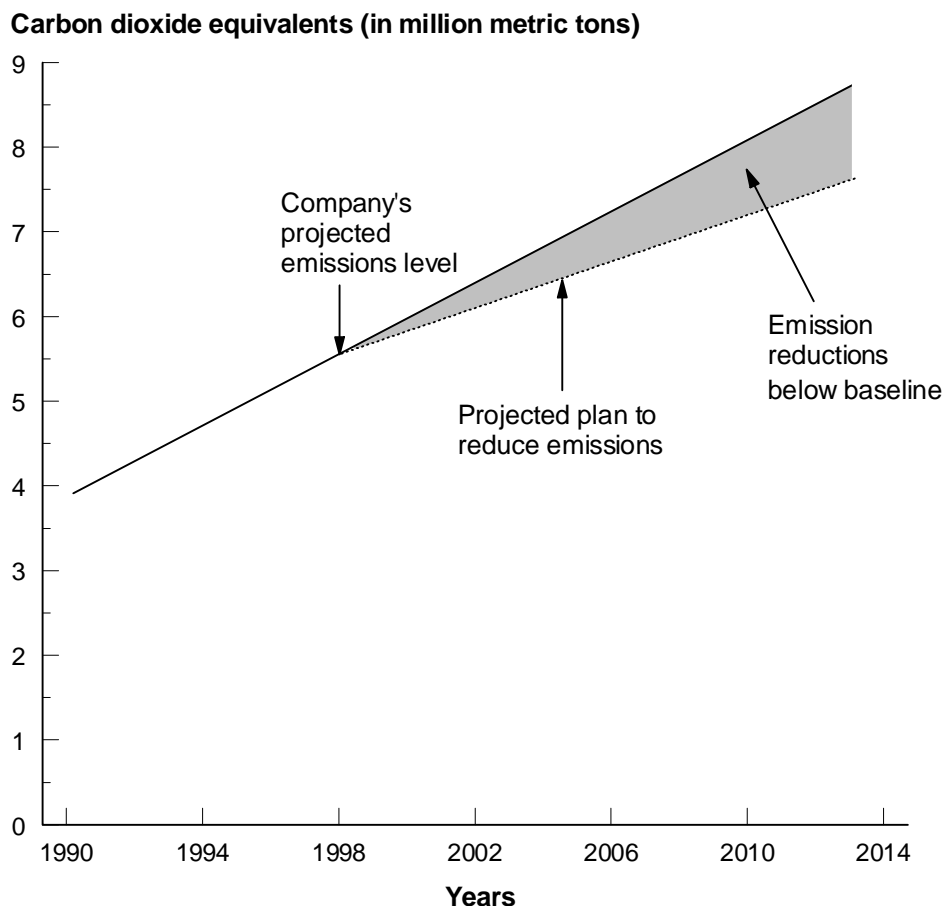
emissions are expanding. For example, a small manufacturing company that generated 5.5 million metric tons of carbon dioxide equivalents in 1990 and today generates 8.5 million metric tons might have experienced this increase because of business expansion. This company will be faced with the decision to either take steps to reduce its emissions or purchase emissions reduction credits from another company that was able to achieve reductions below its baseline. In contrast, companies in economic decline could more easily demonstrate reductions. The historical baseline was the approach selected for the Kyoto Protocol.

While the Environmental Defense Fund has essentially supported the historical baseline concept, it has also noted that alternative methods would also be acceptable, if they produced greater precision or reliability. Both DOE's Energy Information Administration and the Center for Clean Air Policy have noted that, with the historical baseline approach, only reductions below that baseline would be recognized as creditworthy.

Another proposal would use a "projected baseline" that reflects what an organization believes would be its emissions over a given period of time. As shown in figure 2, with a projected baseline, an organization would take actions to get below its projected emissions level and would try to continue reducing its emissions to meet specific targets over time.



**Figure 2: Use of a Projected Baseline to Estimate a Company's Carbon Dioxide Equivalent Emissions and Possible Reductions**



Under this approach, any reduction below the projected baseline would be considered creditable (represented by the shaded area in fig. 2).

In the Voluntary Reporting Program, participants have flexibility to choose which baseline approach they want to use to measure their reductions. Because the program tries to encourage participation, organizations are also given latitude in developing their baselines. So far, most of the participants have used a projected baseline.<sup>7</sup>

<sup>7</sup>The Voluntary Reporting Program used the description “modified reference case” to describe a projected baseline approach, noting that this approach essentially presented a hypothetical situation that projected what the greenhouse gas emissions would be if no actions were taken to reduce them.

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Another approach to measure emissions reductions that has been proposed is a rate-based or performance-based system that would determine emissions reductions through changes in emissions levels in relation to a predetermined unit of output of the organization. For example, measurement units could include emissions per unit of revenue earned or emissions per unit of product produced. The concept of developing a standard rate for different industries and industry sectors has also been proposed. For example, the Coalition to Advance Sustainable Technology has supported the rate-based approach because it believes that approach would accommodate a wide range of businesses and industries and attract a greater cross-section of U.S. companies to participate in early efforts to reduce their greenhouse gas emissions.

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## How Should Emissions Reduction Ownership Be Determined?

Who owns the emissions reductions is another issue that will need to be addressed in developing a credit for early action program. While ownership would appear to be easily determined, it is not always clear to the involved parties. Resolving this issue is important because, without clear ownership, there may be problems in reporting and counting emissions reductions.

Ownership of a reduction can be based on a legal determination, established under a contractual arrangement, or can be established by what has been called the chain of causation—who caused the emissions to occur. Central to the ownership issue are the links between parties who may view responsibility for emissions reductions differently, and each may have a legitimate argument for their perspective. An example of the links between manufacturers, retailers, consumers, and power-generating companies reflects the significance and potential complexity of the issue. An appliance manufacturer building a highly energy-efficient product with performance exceeding normal energy efficiency standards for similar products provides an opportunity for several parties to claim emissions reductions. The retailer carrying the product promotes it as a power saver. The electric utility offers rebates to customers for purchasing it. The consumer buys the product, accepts the rebate, and uses less electricity. The electric utility generates less electricity from fossil fuels, thus reducing its greenhouse gas emissions. Thus, responsibility for the emissions reductions and credit is hard to distinguish. Depending on one's position, any of the parties—the manufacturer, the retailer, the consumer, or the electric utility—could be the owner and claim the credit.

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Under the flexibility of the Voluntary Reporting Program, all parties could have submitted claims from this activity. To help address the potential for duplication, the program established the concept of “direct” and “indirect” ownership, which attempts to categorize the claims. Direct ownership refers to emissions from a source owned and controlled by an organization.<sup>8</sup> Indirect ownership refers to emissions that an organization, in some sense, “caused” to occur, although it did not own or control the facility producing the emissions.<sup>9</sup> This approach does not, however, resolve the issue of who would be credited for the claim, and as a result, there is the potential for the double reporting of a reduction.

How ownership issues are resolved would likely influence the size and scope of a credit for early action program. DOE’s Energy Information Administration and the Environmental Defense Fund have pointed out that determining ownership and reporting responsibility would influence the size and scope of a credit for early action program. Environmental Defense Fund officials have indicated that a decision might need to be made on whether all U.S. greenhouse gas emitters should report emissions reductions or whether only the largest companies, those emitting the majority of greenhouse gases, should report. This decision depends on whether the goal of the program is to stimulate wide participation, to focus on where the greatest potential for reductions can be achieved, or some combination of both goals. In this regard, the Center for Clean Air Policy has raised the question of whether participation should include fuel producers or fuel users or both and thought that a credit program should focus on fuel users.

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### What Is the Reporting Level for an Emissions Reduction?

Determining how claims for emissions reductions should be reported is another important issue in designing a credit for early action program. This issue focuses on whether emissions are recognized at the project or organizationwide level. Reporting at the organization level would indicate whether an entire organization is actually reducing its overall greenhouse gas emissions. Reporting at the project level would likely reflect the positive results of selected projects but would not convey information on an organization’s overall achievement.

For example, suppose a large electric power utility reported carbon dioxide reductions from replacing a boiler in one of its four coal-fired

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<sup>8</sup>For example, the emissions from a car’s tailpipe are direct emissions for the car owner.

<sup>9</sup>Electricity consumers, such as households and manufacturers, tend to view themselves as indirect emitters and reducers of greenhouse gases because of their use of the electricity.

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plants with a new gas-fired boiler that produced lower emissions. The company could claim the difference between the emissions of the coal- and gas-fired boilers as a reduction in carbon dioxide. While this claim could appear to reflect a reduction in emissions, if the company did not report that it also had to increase the generating time of its other three coal-fired plants, to produce the same amount of electricity, it would not have accurately reflected companywide emissions. In this case, a net increase would have occurred, not a reduction in the company's total emissions.

Some organizations believe that any emissions reductions are valuable and should be encouraged and receive some type of credit. The Edison Electric Institute believes that any effort to deny credit for reductions at the project level would discourage companies from taking early actions to reduce their greenhouse gas emissions. It believes that a more flexible approach should be taken to increase participation and reductions at this early stage of our national efforts to reduce greenhouse gas emissions.

The reporting level has also been addressed by several other groups involved in the issue of reporting emissions reductions. In its position statement on credit for early action, the Center for Clean Air Policy said that participants in such a program should report on a comprehensive companywide level.<sup>10</sup> The Center also stated that adjustments should be made for changes to or replacements of a company's assets. The Environmental Defense Fund has expressed support for companywide reporting over project-level reporting for similar reasons, namely that the latter does not provide an accurate picture of a company's total emissions reductions. DOE's Energy Information Administration has stated that, without companywide reporting, it would not be possible to determine if a company's overall emissions were reduced. While the Voluntary Reporting Program permitted emissions reduction claims at both the organization and project level, the program was not designed to automatically grant credit for emissions reductions and thus preserved opportunities to report alternative approaches.

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## How Should Emissions Reduction Claims Be Verified?

Providing some assurance that claims for emissions reductions are legitimate and accurately developed will also be a key issue in determining any credits for reductions through an early action program. There appears

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<sup>10</sup>The Center for Clean Air Policy is a nongovernmental bipartisan policy organization focused on research and advocacy of market-based approaches to environmental problems.

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to be a consistent view that these claims would need to receive some type of review and verification.

The options for verification range from self-review and -certification to an independent third-party review. The Voluntary Reporting Program uses self-review and -certification, with program managers reviewing reported information for internal consistency, accurate calculations, and comparisons with other sources of information. However, the program has no procedures to review or verify the supporting documentation to determine if emissions reductions actually occurred. Program officials at the Energy Information Administration said that accurate reporting is encouraged because the reports are open to public scrutiny and that it is illegal to knowingly submit false information on a certified submission. In its position paper on an early credit program, the Coalition to Advance Sustainable Technology, addressed the benefits of establishing a technical group to develop guidelines, standards for quantifying estimates, and protocols for making emissions reduction claims and their review. In contrast, the U.S. Initiative on Joint Implementation, which has been promoting joint initiatives between U.S. companies and non-U.S. partners to reduce emissions of greenhouse gases, is in the process of developing procedures for an independent third-party review and verification of projects included in the initiative.<sup>11</sup>

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## Many Claims for Reductions Reported to the Voluntary Reporting Program Would Probably Be Ineligible for Credit Under a Program With More Restrictive Criteria

Many of the claims for reductions of greenhouse gas emissions submitted to the Voluntary Reporting Program would probably be ineligible for credit depending on the restrictive nature of the crediting mechanism. While the voluntary program was designed to encourage wide participation by allowing companies to submit emissions reduction claims under flexible alternative reporting criteria, it was not designed to automatically provide emissions credits to participants. A program to grant credits for early actions taken to reduce greenhouse gas emissions would probably require more restrictive reporting criteria to help ensure that the reductions claimed are real, not being double reported by others, and accurately determined.

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<sup>11</sup>This initiative is supported by a Secretariat of several agencies, including the departments of Agriculture, Commerce, Energy, State, the Interior, and the Treasury, as well as the Agency for International Development and the Environmental Protection Agency. Climate Change: Information on the U.S. Initiative on Joint Implementation (GAO/RCED-98-154, June 29, 1998).

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**Comparison of a Flexible  
Voluntary Reporting  
Program With Two More  
Restrictive Sets of Criteria**

The Voluntary Reporting Program was designed to provide companies with wide flexibility in reporting their claims for reductions of greenhouse gas emissions. Depending on the type of credit program developed, reductions reported under the voluntary program may or may not meet the new reporting criteria. According to DOE's Energy Information Administration and industry experts whom we identified that were considering options on how a credit for early action program might be developed, the program could establish more restrictive definitions of, among other things, the baseline, or point from which to measure reductions, than the voluntary program.

With that in mind, we analyzed two sets of more restrictive reporting criteria that potentially could be part of a future credit for early action program and compared them to the voluntary program. Each set of criteria varied by the range of restrictions reflecting lower and upper boundaries placed upon the participants.<sup>12</sup> Table 1 analyzes each of the four basic issues needing resolution in an early credit program by using three sets of reporting criteria—the current flexible Voluntary Reporting Program and two sets of more restrictive criteria. The first column lists the four basic issues as questions to decide. The second column describes the flexible criteria currently used in the Voluntary Reporting Program. The third and fourth columns describe the more restrictive criteria.

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<sup>12</sup>Other more or less restrictive criteria could be developed; the criteria presented here are for illustrative purposes and should not be considered all-inclusive. The two sets of criteria essentially reflect the views of organizations involved with the development of an early action program.

**Table 1: Comparison of the Criteria in the Flexible Voluntary Reporting Program With Two More Restrictive Sets of Criteria**

Issues	Flexible <sup>a</sup>	Somewhat restricted <sup>b</sup>	Restricted <sup>c</sup>
(1) How should emissions reductions be estimated?	Organization estimates an emissions reduction from any historical and/or projected level	Program estimates an emissions reduction from a historical, projected, and/or rate-based baseline	Program estimates an emissions reduction from a fixed or historical baseline
(2) How should emissions reduction ownership be determined?	Assigned to the legal owner of the exhaust stack and/or assigned by contract (direct), and/or created by causal links (indirect) <sup>d</sup>	Assigned to the legal owner of the exhaust stack and/or assigned by contract (direct), and/or created by causal links (indirect) <sup>d</sup>	Assigned to the legal owner of the exhaust stack and/or assigned by contract (only direct) <sup>d</sup>
(3) Should the emissions reduction claims be reported at the organization, project or some other level?	Organization decides level of reporting (i.e., organizationwide and/or by project)	Program requires reporting the total emissions reductions of the organization	Program requires organizational reporting and may designate industry groups and/or geographic regions <sup>e</sup>
4) How should emissions reduction claims be verified?	Self-certification	Self-certification with some independent verification	Independently reviewed and verified

<sup>a</sup>The “Flexible” reporting criteria we designed to resemble the Voluntary Reporting Program, which has such other goals as to encourage participation, to take actions to reduce greenhouse gas emissions, and to provide reporting organizations with discretion in developing emissions estimates, claiming ownership, and reporting actions taken.

<sup>b</sup>The “Somewhat restricted” reporting criteria capture a selected range of potential criteria for a credit program that have been conveyed by such organizations as the Environmental Defense Fund, the Coalition to Advance Sustainable Technology, and the Center for Clean Air Policy. While these criteria have the overall objective of accounting for real emissions reductions, they are less stringent than the “Restricted” for (1) measuring the starting point for estimating reductions, (2) allowing indirect ownership (i.e., reductions that the organization in some sense “caused” to occur, although the organization did not own the facility producing the emissions), and (3) verifying claims.

<sup>c</sup>The “Restricted” reporting criteria use a historical base from which to measure reductions. An example of a historical base is the Kyoto Protocol, which generally requires the United States to reduce its greenhouse gas emissions to 7 percent below what they were in 1990. The “Restricted” reporting criteria also require independent verification of all reduction claims and only allow credits for reductions by legal or direct owners.

<sup>d</sup>Under the “Flexible” criteria, ownership claims can be direct, indirect, or both. Double reporting of emissions reductions, whereby two or more organizations can claim ownership of the same project-level emissions reductions, are allowed. For example, double reporting occurs when one organization claims direct emissions reduction ownership while one or more other organizations claim indirect ownership of those same reductions. Under the “Somewhat restricted” criteria, ownership claims can be either direct or indirect, and double reporting is not allowed. For example, if one organization claims direct ownership of certain emissions reductions, no other organization may claim any type of ownership of these same reductions. Under both sets of criteria, there has to be a chain of causation for indirect claims, as between the electricity generator and the electricity user or the automobile manufacturer and the automobile purchaser. Under the “Restricted” criteria, only the legal owner (i.e., direct or assigned by contract by the direct owner) is allowed to claim ownership of the emissions reductions.

<sup>e</sup>Under the “Restricted” reporting criteria, the program can require organization-level reporting and may also designate industry groupings and/or regional areas to capture emissions sources.

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Comparing the two sets of more restrictive reporting criteria that could be part of a future credit for early action program (see table 1) to claims reported to the Voluntary Reporting Program indicates that many would probably be ineligible for credit. According to information from DOE's Energy Information Administration, the issues of (1) how emissions reductions should be estimated and (2) whether the emissions reduction claims should be reported at the organization, project, or some other level illustrate why many reported claims would probably be ineligible for credit. For example, according to the Energy Information Administration's reports summarizing the results of the first and second years of the Voluntary Reporting Program,<sup>13</sup> only 22 of the 250 companies reporting, or about 9 percent, reported organizationwide reductions from some historical baseline and thus would meet the "Restricted" reporting criteria. With regard to the issue of reporting level, only 91, or about 36 percent, of the organizations claimed emissions reductions for their entire company and thus would meet the organizationwide reporting criteria of the "Somewhat restricted" reporting criteria.

Since we could not easily determine how many of the current participants to the Voluntary Reporting Program are reporting ownership of emissions reductions that may also be reported by others, we did not compare the criteria for it to the two sets of more restrictive reporting criteria. Under the Voluntary Reporting Program, no independent verification was required. Therefore, if some form of independent verification were required to receive a credit for reductions through an early action program, none of the current claims submitted to the Voluntary Reporting Program would be automatically eligible without further review or some demonstration that independent verification had been done.

We provide further perspective on these four issues by selecting some examples of actual reduction claims submitted to the Voluntary Reporting Program to show how they would fare under more restrictive reporting criteria (see app. III.)

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## Agency Comments and Our Evaluation

We provided a draft of this report to DOE for its review and comment. We obtained comments on the results of our work from the Department of Energy, including the Director, Office of Economic, Electricity, and Natural Gas Analysis, Office of the Assistant Secretary for Policy; and the Director, International Greenhouse Gases, and Macroeconomic Division

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<sup>13</sup>We included information on only the program's first 2 years (1994 and 1995) because at the time of our review, the Energy Information Administration had not issued more recent annual reports summarizing data on the program.



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(the division that is responsible for administering the Voluntary Reporting Program), Energy Information Administration.

DOE agreed with the information in the report and observed that while the Voluntary Reporting Program was not specifically designed to automatically provide credit, it does provide a mechanism for organizations to demonstrate their achieved reductions of greenhouse gas emissions, should a credit for early action program be established. In this regard, we clarified the text throughout the report to include this observation. DOE also made other clarifying comments, which we incorporated as appropriate.

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We conducted our work from July 1998 through October 1998 in accordance with generally accepted government auditing standards. As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Secretary of Energy and the Administrator of the Energy Information Administration. We will also make copies available to others on request.

If you or your staff have any questions concerning this report, please call me at (202) 512-3841. Major contributors to this report are listed in appendix IV.

Sincerely yours,



Susan D. Kladiva  
Associate Director, Energy,  
Resources, and Science Issues

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**Abbreviations**

DOE      Department of Energy

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# Objectives, Scope, and Methodology

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To address the question of issues associated with developing a credit for early action program, we primarily reviewed documentation and conducted interviews with the Department of Energy (DOE) and other groups involved in reporting emissions of greenhouse gases. We conducted interviews on issues related to reporting greenhouse gas emissions and the concept of a credit for early action with officials and professional staff from DOE's Energy Information Administration's Voluntary Reporting Program. We reviewed the Voluntary Reporting Program's reporting guidance and issues identified by the program officials through their experience with emissions reduction claims. We also reviewed the program's summary reports and a cross section of reports claiming emissions reductions by participants in the program.

We obtained the views and the perspectives of other public and private sector groups involved in issues relating to global climate change and greenhouse gas emissions. We obtained and reviewed available documentation from several organizations involved with the issues, including the Center for Clean Air Policy, the Coalition to Advance Sustainable Technology, the Environmental Defense Fund, the Edison Electric Institute, the Pew Center on Global Climate Research, the Nature Conservancy, and Resources for the Future. When possible, we interviewed some of these groups to obtain additional information on their positions. We also obtained and reviewed related reports and information from the Congressional Research Service and the Environmental Protection Agency.

To address the question of how emissions reduction claims that are submitted to the Voluntary Reporting Program might be considered under a credit for reductions through an early action program, we reviewed program data on the basic issues and judgmentally selected several examples of claims that reflected some of those basic issues. We then considered two sets of more restrictive reporting criteria that could potentially be part of a credit for early action program and compared them to the Voluntary Reporting Program. This comparison highlights some of the decisions that have to be made in developing a credit for early action program.

As agreed with your office, we did not present the names of the organizations whose emissions reduction claims we used to, in part, illustrate how some claims could fare under different emissions reporting criteria.

# Other Issues That May Need to Be Considered in Developing a Credit for Early Action Program

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This appendix provides a brief description of some of the other issues that may need to be considered in designing a credit program for early actions to reduce greenhouse gas emissions. These descriptions are not intended to be all inclusive but rather a brief overview of each issue and why it is important.

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## Should an Emissions Credit Trading System Be Established?

An emissions trading system provides a vehicle for the transfer of ownership of emissions reduction credits from one party to another. Some groups have suggested that a trading system would be an incentive for organizations to participate in an early credit program. This is because some organizations may have difficulty reducing their greenhouse gas emissions, while others may be capable of reducing their emissions significantly. Therefore, an emissions trading system provides an economic incentive for companies to achieve maximum levels of emission reductions at the least cost. Companies could choose the lower cost option of either buying credits or making the changes in their operations to reduce its own emissions.

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## Should Carbon Sequestration Projects Be Included in a Credit Program for Early Action?

Carbon sequestration is the capturing of carbon dioxide from the atmosphere through the process of photosynthesis.<sup>1</sup> It plays a significant role in reducing the amount of carbon dioxide in the atmosphere; each year, about 100 billion metric tons of carbon dioxide is captured in trees and other vegetation throughout the world. At issue, are concerns about how estimates are developed and what source data are used. For example, according to a recent Congressional Research Service report examining sequestration projects reported to the Voluntary Reporting Program, the sequestration claims were difficult to compare because of variations in how the quantities were measured and the source data used for the estimates.<sup>2</sup> Therefore, how sequestration projects will be handled in a credit for early action program becomes an important issue.

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<sup>1</sup>Photosynthesis is a process through which plants extract carbon dioxide from the air, separate the carbon from the oxygen atoms, return the oxygen to the atmosphere, and use the carbon to make biomass in the form of roots, stems, and foliage.

<sup>2</sup>Forestry Projects in the United States to Offset Carbon Emissions, Congressional Research Service, Apr. 23, 1998

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**Should Credit Be Given for “Business as Usual” Activities That Also Reduce Greenhouse Gas Emissions?**

There are differing views on the issue of whether to recognize emissions reductions that would have occurred anyway, without the incentive of a credit for early action program. Some organizations thought that if an organization took an action that would be considered part of its normal business activities and it also happened to reduce greenhouse gas emissions, it should not receive recognition for this reduction because it would have occurred anyway. Others organizations, including Edison Electric Institute, believe that any efforts to reduce greenhouse gases are worthy of some type of recognition and putting restrictions on these kinds of reductions could discourage participation in an early action program.

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**What Greenhouse Gas Emissions Should Be Included in a Credit for Early Action Program?**

Numerous gases affect the Earth’s atmosphere and act as “greenhouse gases” which trap heat from sunlight at, or close to, the Earth’s surface. In addition to the six greenhouse gases that were recognized in the Kyoto Protocol,<sup>3</sup> other greenhouse gases, as well as other gases that have “indirect effects” on global warming because they may contribute to the buildup or decomposition of the greenhouse gases in the atmosphere. Some of these gases include carbon monoxide and volatile organic compounds other than methane. Because the Voluntary Reporting Program allows the reporting of these gases, there may be a need to consider to what extent they should be included in an early action program.

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**Other Additional Questions That Early Credit Program Developers May Have to Address**

- Should an organization reporting to the Voluntary Reporting Program be treated differently under a new credit for early action program?
- How will growing companies be able to reduce greenhouse gas emissions without affecting economic success? Should growing and declining companies be treated the same under a credit for early action program?
- Should there be restrictions on who is eligible to receive emissions credits?
- Should a credit for early action program be focused on the entire U.S. economy or selected segments that represent the majority of greenhouse gas emitters?
- How should a historical base for measuring reductions be adjusted for corporate mergers and acquisitions?
- How should companies having no historical data be treated?

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<sup>3</sup>The six gases are carbon dioxide; methane; nitrous oxide; hydrofluorocarbons; perfluorocarbons; and sulfur hexafluoride.

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# How Emissions Reduction Claims That Are Reported to the Voluntary Reporting Program May Be Considered Under More Restrictive Reporting Criteria

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The following examples of actual claims of greenhouse gas emissions reductions that companies have reported to the Voluntary Reporting Program serve to (1) further illustrate the four basic issues that will likely need to be addressed in designing a credit for early action program and (2) show how such claims may be evaluated if more restrictive reporting criteria were established. We used examples contained in the DOE's Energy Information Administration publications that summarize the results of the program's first and second years.<sup>4</sup> We supplemented this information with information contained in the program's public database.<sup>5</sup>

The first issue is how should greenhouse gas emissions reductions be estimated. A large investor-owned utility located in the Midwest produces electric power from several fossil-based plants and one nuclear plant. It compared its 1991, 1992, and 1993 emissions to those that had occurred in 1990 to calculate its emissions reductions. However, in 1994 its nuclear plant was shut down because of an equipment failure. To compensate for the lost electricity that had been generated from its nuclear power plant, it increased generation from its fossil plants, reduced sales, and purchased electricity from another company.<sup>6</sup> As a result, in 1994, its emissions rose for the first time beyond its 1990 baseline and it reported an emissions increase. This example meets the "Restricted" reporting criterion shown in table 1 on determining reductions from a historical baseline. However, the utility would not have received credit in 1994 because its emissions increased above its 1990 level.

The second basic issue is how should emissions reductions ownership be determined. A large investor-owned utility took several specific actions to improve the reliability and performance of its two nuclear power generators (one unit is 100 percent owned by the utility and the other unit is 41 percent owned). One action increased the time between refueling from 18 months to 24 months. Another action decreased the number of days for each refueling outage. A third action improved maintenance procedures, which reduced forced outages and automatic shutdowns. As a

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<sup>4</sup>Voluntary Reporting of Greenhouse Gases 1995, July 1996, Department of Energy, Energy Information Administration, DOE/EIA-0608(95); Mitigating Greenhouse Gas Emissions: Voluntary Reporting, Oct. 1997, Department of Energy, Energy Information Administration, DOE/EIA-0608(96). The first report covers annual emissions from 1987 to 1994 and annual reductions claimed between 1991 and 1994 and the second report presents this information for 1995.

<sup>5</sup>We reviewed companies claims submitted to the Energy Information Administration on their emissions reductions for consistency but did not contact them directly to verify their information. In addition, the company information discussed in the examples contains only a portion of the company's total report. As such, we did not compare the entire company's report to the more restrictive criteria.

<sup>6</sup>Nuclear power plants rely on nuclear fuels to generate electricity and do not emit greenhouse gases.

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**Appendix III**  
**How Emissions Reduction Claims That Are**  
**Reported to the Voluntary Reporting**  
**Program May Be Considered Under More**  
**Restrictive Reporting Criteria**

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result of these actions, the utility claimed total cumulative reductions in carbon dioxide emissions from 1991 to 1994 compared with its 1990 baseline of more than 11 million metric tons. The utility reported only 41 percent (its ownership share) of the emissions reductions for the second unit. This example meets the “Restricted” reporting criterion shown in table 1 on reporting only those emissions reductions that are directly owned.

Another example helps to clarify the differences between “direct” and “indirect” ownership of emissions reductions. A printing company based in Wisconsin initiated some projects to reduce its own and its employees’ demand for transportation services. These projects included (1) a return load policy requiring its trucks not to return empty, thus saving 8 million vehicle miles per year; (2) a change from three 8-hour shifts to two 12-hour shifts, which allows employees to work fewer days per year, thus reducing their commuting trips and associated emissions by an estimated 20 million fewer miles in 1995; (3) the redevelopment of an existing building structure which was closer to town and workers’ homes than a new proposed site, thus saving them an estimated 3.5 million vehicle miles in 1995; and (4) an arrangement for the public transportation system to have buses provide service to its plants, thus reducing the number of employees’ vehicle round trips by 23,185 and saving more than 20,000 gallons of gasoline. Under the Voluntary Reporting Program, the company claimed “direct” emissions reductions associated with the return load policy, and “indirect” reductions associated with the shift change, the building redevelopment, and the public transportation projects. Under the “Restricted” reporting criterion shown in table 1 on obtaining credit for only those reductions directly owned, the company would receive credit only for the return load policy savings because the company directly owned the trucks and their emissions. Under the “Somewhat restricted” criterion on ownership, the company would receive credit for the indirect reductions in workers’ driving miles if the company could show that the employees and the bus company did not claim them.

The third basic issue concerns the level at which emissions reductions should be reported. An investor-owned utility located in the Midwest built a 16 megawatt natural-gas fired cogeneration facility to meet the electricity and steam needs of a grain-processing company.<sup>7</sup> The grain company retired its own coal-fired boilers and less efficient gas-fired boilers that had been used to make the steam needed for its operations. On a

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<sup>7</sup>Cogeneration is the sequential production of useful thermal energy, such as steam and hot water and electricity from the same energy source. In this case, the primary source of energy was used to produce electricity, with the thermal energy recovered from that process used to produce steam.



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**Appendix III  
How Emissions Reduction Claims That Are  
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project-level basis, the utility reported direct and indirect emissions reductions resulting from the operation of the cogeneration facility and the shutdown of the grain processor's steam boilers. The utility claimed direct emissions reductions by comparing electricity generation that would have otherwise occurred at its coal-fired plant. It also claimed indirect reductions from, among other things, the grain company's previous replacement of the coal-fired steam boilers with gas-fired steam boilers. None of the company's claims would have been accepted under the "Restricted" or "Somewhat restricted" criteria because these claims were reported at a project level, and it is unknown whether the company as a whole had net reductions.

The last basic issue concerns how are emission reductions verified. All companies' reporting to the Voluntary Reporting Program are required to self-certify the accuracy of their emissions reduction estimates. Independent or third-party verification is not required. As a result, we were not able to find any company that went beyond the self-certification process.

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